

School of Computer Science

Important Degree Information:

B.Sc./M.A. Honours

The general requirements are 480 credits over a period of normally 4 years (and not more than 5 years) or part-time equivalent; the final two years being an approved Honours programme of 240 credits, of which 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or M.A. degree.

B.Sc./M.A. Honours with Integrated Year Abroad

The general requirements are 540 credits over a period of normally 5 years (and not more than 6 years) or part-time equivalent; the final three years being an approved Honours programme of 300 credits, of which 60 credits are gained during the integrated year abroad, 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or M.A. degree.

Other Information: In the case of students who spend part of the Honours programme abroad on a recognised Exchange Scheme, the Programme Requirements will be amended to take into account courses taken while abroad. From 2009/10, the School will to participate in ID4001 (Communication and Teaching in Science). This may be taken by Single Honours Computer Science/Internet Computer Science students as an alternative to 3000- and/or 4000-level option credits, as shown below.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): Computer Science	<p>Single Honours Computer Science (B.Sc. Honours):</p> <p>Level 1: At least 40 credits consisting of CS1002 and CS1004</p> <p>Level 2: 60 credits consisting of passes at grade 11 in both CS2001 and CS2002</p> <p>Level 3: 120 credits consisting of:</p> <ul style="list-style-type: none"> - 60 credits from CS3051 - CS3099 - 60 credits from CS3101 - CS3399 <p>Level 4: 120 credits consisting of:</p> <ul style="list-style-type: none"> - 45 credits from CS4052 - CS4099 - at most 30 credits from CS5101 - CS5199 - at most 30 credits from CS3101 - CS3399, ID4001 - remaining credits from CS4101 - CS4999

Degree Programmes	Programme Requirements at:
<p>(B.Sc. Honours): Computer Science and one of Economics, Logic & Philosophy of Science, Management, Management Science, Mathematics, Physics or Statistics</p>	<p>Computer Science element of Joint Honours Degree (B.Sc.): Level 1: 40 credits consisting of CS1002 and CS1004 Level 2: 60 credits consisting of passes at grade 11 in both CS2001 and CS2002 Level 3: 60 credits consisting of CS3051, CS3052, CS3099 and 15 further credits from CS3053 and CS3100 - CS3999. Level 4: 60 credits, consisting of: - 30 credits from CS4052 - CS4098 - at most 30 credits from CS5101 - CS5199 - at most 15 credits from CS3101 - CS3399, ID4001 - remaining credits from CS4101 - CS4999</p>
<p>(B.Sc. Honours): Computer Science and Psychology</p>	<p>Computer Science element of Joint Honours Degree (B.Sc.): Level 1: 40 credits consisting of CS1002 and CS1004 Level 2: 60 credits consisting of passes at grade 11 in both CS2001 and CS2002 Level 3: 45 credits from CS3001 - CS3399, including at least one of CS3051 and CS3099. Level 4: 45 credits, consisting of: - CS4098 - at most 30 credits from CS5101 - CS5199 - remaining credits from CS4051 - CS4999</p> <p>Note: The total Honours credits in Computer Science and in Psychology must be at least 240, of which at least 90 must be at 4000 level.</p>
<p>(B.Sc. Honours): Computer Science with French^{W N}</p> <p>^W Available also as 'With Integrated Year Abroad Degrees'</p> <p>^N This programme is only available to those already enrolled in it.</p>	<p>Computer Science major element of B.Sc. Degree with Modern Languages: Level 1: At least 40 credits consisting of CS1002, CS1004 and (either CS1010 or appropriate mathematics background) Level 2: 60 credits consisting of passes in both CS2001 and CS2002, at grade 11 or better except with the Head of School's permission Level 3: Normally in the Junior Honours year, 90 credits, consisting of: - 30 credits from CS3001 - CS3099 - 30 or 45 credits from CS3101 - CS3199 - remaining credits from CS3201 - CS3299 Level 4: Normally in the Senior Honours year, 90 credits, consisting of: - 15 (or more) credits from CS4076 - CS4099 - 45 (or more) credits from CS4101 - CS4199 and CS4201 - CS4299, including 15 (or more) credits from CS4201 - CS4299 - remaining credits from CS3001 - CS4999</p>

Degree Programmes	Programme Requirements at:
<p>(B.Sc. Honours): Internet Computer Science</p>	<p>Single Honours Internet Computer Science B.Sc. Degree:</p> <p>Level 1: 40 credits consisting of CS1002 and CS1004</p> <p>Level 2: 90 credits consisting of passes at grade 11 in CS2001, CS2002 and CS2003</p> <p>Level 3: 120 credits consisting of:</p> <ul style="list-style-type: none"> - 60 credits from CS3051 - CS3099 - 45 credits from CS3102, CS3301 and CS3302 - 15 other credits from CS3101 - CS3399 <p>Level 4: 120 credits consisting of:</p> <ul style="list-style-type: none"> - 45 credits from CS4052 - CS4099 - 45 credits from CS4103, CS4203 and CS4302 - at most 30 credits from CS5101 - CS5199 - at most 30 credits from CS3101 - CS3399, ID4001 - remaining credits from CS4101 - CS4999
<p>(B.Sc. Honours): Internet Computer Science and one of Economics^N, or Mathematics^N</p> <p>^N These programmes are only available to those already enrolled on them.</p>	<p>Internet Computer Science element of Joint Honours B.Sc. Degrees:</p> <p>Level 1: At least 40 credits consisting of CS1002, CS1004 and (either CS1010 or appropriate mathematics background)</p> <p>Level 2: 60 credits consisting of passes in both CS2001 and CS2003, at grade 11 or better except with the Head of School's permission</p> <p>Level 3: Normally in the Junior Honours year, 60 credits, consisting of:</p> <ul style="list-style-type: none"> - 15 credits from CS3099 - 45 credits from CS3051, CS3101 - CS3199 and CS3301 - CS3399, including 15 (or more) credits from CS3301 - CS3399 <p>Level 4: Normally in the Senior Honours year, 60 credits, consisting of:</p> <ul style="list-style-type: none"> - 15 (or more) credits from CS4076 - CS4099 - 30 (or more) credits from CS4101 - CS4199, CS4301 - CS4399, including 15 (or more) credits from CS4301 - CS4399 - remaining credits from CS3001 - CS4999

Students still completing degree programmes as defined in previous Course Catalogues should discuss their module selections with their Honours Adviser(s).

Modules

Normally the prerequisite for each of the following Honours modules is entry to the Honours Programme(s) for which it is specified, as well as any additional specific prerequisite(s) given.

Computer Science – Honours 2011/12 – August 2011

General Degree students wishing to enter 3000-level modules and non-graduating students wishing to enter 3000-level or 4000-level modules must consult with the relevant Honours Adviser within the School before making their selection.

Computer Science (CS) Modules

CS3051 Software Engineering

Credits: 15 Semester: 1

Prerequisites: CS2001 and (CS2002 or CS2003)

Description: This module introduces software engineering through lectures, associated practical work, seminar reports and essays. We define software engineering and consider those attributes of software which distinguish a well-engineered system from a badly-engineered system, concentrating on the differences between large systems and small ones, and introduce some concepts of software design and good programming practice. We will concentrate in particular on object-oriented techniques and Java programming.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3052 Computational Complexity

Credits: 15 Semester: 2

Prerequisites: CS2001 and CS2002

Anti-requisites: CS3103 and CS3201

Description: The module builds upon sub-honours lectures on finite state machines, grammars, complexity classes and complexity analysis. After a brief review of these topics, we consider the decidability and Turing-recognisability of classes of problems at the abstract level of languages of strings over an alphabet. We then deal with the complexity analysis of decision problems arising at a lower level of abstraction, such as graphs and networks, AI search and computational biology. We introduce the classes P and NP, the notions of polynomial reduction and NP-completeness, and prove Cook's theorem on the existence of NP-complete problems.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3053 Research & Professional Issues in Computing

Credits: 15 Semester: Whole Year

Prerequisites: CS2001 and CS2002

Anti-requisite: CS4051

Description: The aim of the module is to develop knowledge of the social and professional issues in computer science along with an elementary understanding of research methodology and some current hot research topics. Guidance, practice and assessment will be provided in the preparation and delivery of talks, critical reading of the literature, report and essay writing, including the preparation and presentation of a possible research project. There will be team debates on social, ethical and professional issues.

Class Hour: To be arranged.

Teaching: 1 lecture, 1 seminar, 1 tutorial.

Assessment: Continuous Assessment = 100%

CS3099 Software Team Project

Credits: 15 Semester: Whole Year

Availability: Not available to General Degree Students

Prerequisites: CS2001 and (CS2002 or CS2003)

Description: This module aims to allow students to take part in a substantial software engineering project as part of a team, using professional development techniques. Each team will specify, plan, design, implement and document a medium-sized software system under the guidance of a member of staff. Teams are required to cooperate in order to produce successful solutions. Typically, the software system will simulate a real world problem, proposed by the module co-ordinator acting as a customer.

Class Hour: To be arranged.

Teaching: Weekly seminars and practical classes.

Assessment: Continuous Assessment = 100%

CS3101 Databases

Credits: 15 Semester: 2

Prerequisites: CS2001 and (CS2002 or CS2003)

Description: This module aims (i) to study data models, indexing techniques and query processing; (ii) to study database systems including concurrency, transactions, distribution and recovery. The syllabus includes: data models; indexing, hashing and query processing; concurrency, transactions and recovery; security and integrity.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3102 Data Communications & Networks

Credits: 15 Semester: 2

Prerequisites: CS2001 and (CS2002 or CS2003)

Description: This module aims (i) to introduce the basics of data communications and computer networks, and (ii) to examine network protocols and architectures. The syllabus includes: the concepts of protocols, layered models, resource sharing and standards; transmission media; analog and digital data encoding; reliable communication; error detection and correction; flow control; link-level efficiency and sliding window protocols; medium access control policies and mechanisms; LAN topologies and extended LANS; network topologies, internetworks and network routing; connection-oriented and connectionless networks; transport level protocols; congestion control; QoS for different traffic types; Study of particular networks and protocols such as the traditional telephone network; the Internet; WiFi, FDDI, Ethernet, ISDN, TCP/IP, ATM. Network programming APIs such as sockets.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3104 Operating Systems

Credits: 15 Semester: 1

Prerequisites: CS2001 and (CS2002 or CS2003)

Description: This module aims (i) to examine in depth the changing role of the operating system; (ii) to study the concept and implementation of *process*; (iii) to study the OS/hardware interface with regard to storage and protection; (iv) to study the techniques developed to achieve safety and throughput in a multitasking system. The syllabus includes: structured computer organisation; process definition and implementation; interprocess communication and synchronisation; review of scheduling; review of file systems; storage management.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

Computer Science – Honours 2011/12 – August 2011

CS3105 Artificial Intelligence

Credits: 15 Semester: 2

Prerequisite: CS2001, CS2002

Anti-requisite: CS4101

Description: This module aims to provide understanding of the general features of the A.I. problem solving process, and in particular to explain the various forms of heuristic together with their implementation and case studies of real systems. The syllabus includes aspects of action and planning, learning, reasoning.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3106 Human Computer Interaction

Credits: 15 Semester: 1

Prerequisites: CS2001, CS2002

Anti-requisite: CS4104

Co-requisite: CS3051

Description: This module covers the main aspects of Human Computer interaction. Design guidelines, structured design methods and standards are studied and practice is given in implementation and evaluation. Students will have experience of current interactive audio, visual and manipulative technologies.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3301 Component Technology

Credits: 15 Semester: 2

Prerequisites: CS2001 and CS2003

Description: The module will provide students with a knowledge and understanding of current and emerging component technologies. The module is focused on two major themes: Object-Oriented Middleware (OOM) and Message-Oriented Middleware (MOM). In the first theme we examine the evolution of object-oriented programming into (distributed) component models such as The Common Object Request Broker Architecture (CORBA), The Component Object Model (COM), Java Remote Method Invocation (RMI) and Java Beans. The common underlying requirements of these systems will be studied in detail such as naming and binding issues and marshalling and un-marshalling of data. The second theme will explore the emerging field of Message-Oriented Middleware with an in-depth study into current MOM technologies such as Java Messaging System (JMS).

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS3302 Data Encoding

Credits: 15 Semester: 1

Prerequisites: CS2001 and CS2003

Description: This module aims to explain the techniques used to encode data, emphasising in turn the ideas of: security and secrecy, error correcting capabilities, data compression. The syllabus comprises: the weakness of early encryption schemes, the Data Encryption Standard, public key schemes including RSA; attacks on RSA by integer factorisation; Hamming distance, linear codes, parity check equations; Hamming codes, BCH codes; information and uncertainty, run encoding, Huffman encoding.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4051 Professional & Social Aspects of Computing

Credits: 15 Semester: Whole Year

Prerequisite: CS3099

Description: This module aims: (i) to enable students to gain a broad general knowledge of some current research areas in computer science and their application in industry and commerce, and the non-technical factors which may affect decision-making in these areas; (ii) to make students aware of the social implications and ethical problems which may face the users and builders of computer systems; (iii) to develop skills in collecting and communicating information, managing and leading debate and drawing conclusions. It will consist of three parts: (i) a series of seminars will be given and students will be required to write short reports on a certain number of these and take part in a follow-up discussion; (ii) students will be required to write an essay on a current technological, business or social issue in computer science; (iii) students will be required to give an individual or team presentation on a social or professional issue in Computer Science, and lead and manage a follow-up discussion.

Class Hour: To be arranged.

Teaching: Individual supervision

Assessment: Continuous Assessment = 100%

CS4052 Logic & Software Verification

Credits: 15 Semester: N/A

Availability: Not available 2011-12

Prerequisite: CS3052

Anti-requisite: CS3202

Description: Building on earlier coverage of elementary logic, this module covers the topics of formal proof (including induction), as applied to software specification, validation and verification. A proof assistant such as *PVS* or *Coq* will be employed both in lectures and in practical work, and thus, so far as practicable, all results will be presented with a proof in a machine-checked form. Software correctness is thus presented as a matter not of testing but of pre-execution verification. Typical software covered includes functions on inductively defined data types such as those of lists and trees.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial and practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4098 Minor Software Project

Credits: 15 Semester: Whole Year

Prerequisite: CS3099

Anti-requisite: CS4099

Description: This module aims to allow students to undertake a substantial software engineering project using professional development techniques. Each student will design, specify and construct a medium-sized software system or undertake a formal development and proof of such a system under the guidance of a member of staff. The syllabus is designed on an individual basis.

Teaching: Individual supervision

Assessment: Continuous Assessment = 100%

CS4099 Major Software Project

Credits: 30 Semester: Whole Year

Prerequisite: CS3099

Anti-requisite: CS4098

Description: This module aims to allow students to undertake a substantial software engineering project using professional development techniques. Each student will design, specify and construct a medium-sized software system or undertake a formal development and proof of such a system under the guidance of a member of staff. The syllabus is designed on an individual basis.

Teaching: Individual supervision.

Assessment: Continuous Assessment = 100%

Computer Science – Honours 2011/12 – August 2011

CS4102 Computer Graphics

Credits: 15 Semester: 1

Prerequisite: CS3099

Description: The aims of the module are to provide understanding of the fundamental concepts of computer graphics and to develop the ability to apply the concepts to the generation of realistic, synthetic images of 3D objects and scenes. On completion of the module, students should be competent to undertake many tasks in computer graphics, and should have an understanding of the theory underlying many of the relevant techniques. The syllabus includes: 2D graphics: Display technology, perception & colours, basic drawing algorithms, image manipulation; 3D graphics: Coordinate transformation and perspective geometry, hidden surface removal, lighting using local and global illumination models (ray-tracing and radiosity), surface detail (texture and bump mapping), 3D engine overview; Animation: Procedural, spline motion + rotations, articulated models & particle systems, face animation.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4103 Distributed Systems

Credits: 15 Semester: 2

Prerequisites: CS3099 and CS3102

Description: This module aims to help students to understand the fundamentals of distributed systems with reference to system models, programming languages, algorithmic techniques, concurrency and correctness. The syllabus covers synchronisation & mutex problems, atomic transactions, topologies, CSP, Internet programming and distributed computing, distributed mutex and logical time & causality.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4201 Programming Language Design & Implementation

Credits: 15 Semester: 1

Prerequisites: CS3099 and CS2002

Description: This module aims to study the design and implementation of programming languages. The syllabus includes: language design principles, abstract syntax, evaluation mechanisms, binding, type systems, polymorphism, data encapsulation, exceptions, formal definition of programming languages, compiling techniques, abstract machine design, run-time systems and garbage collection.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4202 Computer Architecture

Credits: 15 Semester: 1

Prerequisites: CS3099, CS3104 and CS2002

Description: This module aims to study the principles and technology of modern computer architectures, with particular emphasis on performance and acceleration. The syllabus consists of: (i) the CPU: pipelined, superscalar, multiprocessor and supercomputer architectures, coprocessors and ASICs, microprogramming; (ii) memory: instruction and data caches; (iii) interconnect architectures: topologies, buses; (iv) performance concepts: latency, bandwidth and analysis; (v) programming models: RISC, CISC, virtual addressing, high-level language support, multiprogramming and multiprocessor consistency; (vi) case studies.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4203 Computer Security

Credits: 15 Semester: 2

Prerequisites: CS3099 and (CS2002 or CS3302)

Description: This module aims to introduce the basic concepts of computer security and cryptography, including common attacks and defences against them, and the legal and policy framework. The syllabus includes: What is security, security applications and policy models. Introduction to access control, typical vulnerabilities. Unix and Internet security, firewalls, intrusion detection, malicious code and countermeasures. Information hiding, Stream ciphers, Block ciphers, Symmetric cryptographic protocols, Asymmetric cryptosystems, Asymmetric cryptographic protocols, Digital signatures, Public key infrastructures, Certification authorities. Security engineering, risk models, robustness, legal and organisational aspects of computer security. Data Protection Act, the Computer Misuse Act, international aspects, export control and key escrow.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4204 Concurrency & Multi-Core Architectures

Credits: 15 Semester: 2

Co-requisite: CS4202

Prerequisites: CS3052, CS3104

Description: Multi-core programming is a new paradigm in computer science that is likely to be dominant in the next decade; already, all the microprocessors in computers and game consoles are multiprocessor-based. This module will present the key concepts of concurrent programming, starting from the theoretical foundations to the analysis of patterns and performance issues in developing this class of programs and systems. Topics include thread programming, mutual exclusion, concurrent objects, shared memory, synchronisation primitives, spin locks, monitors, concurrent lists, skip lists and transactional memory.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4302 Multimedia

Credits: 15 Semester: 1

Prerequisites: CS3099 and CS3102

Description: The module will introduce students to the concepts of analogue and digital media and review current standards and technologies used in the production, transport and rendering of digital multimedia. Within the context of networked multimedia the concept of Quality-of-Service will be introduced and the issues involved in transporting time-sensitive data across computer networks will be explained. Specific examples drawn from Internet-based projects, protocols and standards will be used to illustrate these issues.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

Computer Science – Honours 2011/12 – August 2011

CS4303 Video Games

Credits: 15 Semester: 1

Prerequisites: CS3052

Description: Computer games are now a bigger industry than films. Yet they are continuing to develop and change. Whilst the budget of a new game for Xbox 360 may rival a Hollywood blockbuster, there is also a growing demand for lower octane coffee-break games, that can be accessed for short periods in a browser and for "mobile" that can be played on the go with a mobile device.

This module takes the general-purpose programming abilities acquired in sub honours, and introduces games-specific techniques and material. These are developed as practical skills through lectures and laboratories, and culminate in the creation of actual games.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, 2.5-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4402 Constraint Programming

Credits: 15 Semester: 2

Prerequisites: CS3099

Description: This module introduces constraint-based reasoning as a powerful mechanism for knowledge representation and inference. It provides a thorough grounding in the constraint satisfaction/constrained optimisation problem (CSP/COP) formalism, and covers both basic techniques for implementing constraint solvers and the use of advanced techniques with a commercial solver.

Class Hour: To be arranged.

Teaching: 2 lectures, fortnightly tutorial, two-and-a-half-hour practical.

Assessment: Continuous Assessment = 40%, 2-hour Examination = 60%

CS4499 Computer Science (Special Subject)

Credits: 15 Semester: Either

Prerequisites: Entry to the Single Honours Computer Science or Internet Computer Science Honours programme and the consent of the Head of School

Description: This module is a guided reading module on any aspect of Computer Science not covered by other available modules, intended only for Single Honours students in the School of Computer Science for whom exceptional timetable arrangements (such as a semester or year of absence) restrict the availability of modules unduly.

Class Hour: To be arranged.

Teaching: Tutorials, guided reading, essays, presentations and supervised practicals.

Assessment: Continuous Assessment = 100%

InterDisciplinary (ID) Modules

ID4001 Communication & Teaching in Science

Credits: 15 Semester: 1

Availability: Available only to final year students who have been accepted following application and interview in the preceding semester.

Description: This module is based on the Undergraduate Ambassador Scheme launched in 2002. It provides final year students within the Faculty of Science with the opportunity to gain first hand experience of science education through a mentoring scheme with science teachers in local schools. Students will act initially as observers in the classroom and later as classroom assistants. With permission of the teacher-in-charge, students may also be given the opportunity to lead at least one lesson, or activity within a lesson, during their placement. This module will enable students to gain substantial experience of working in a challenging and unpredictable working environment, and of communicating scientific ideas at various different levels; and to gain a broad understanding of many of the key aspects of teaching science in schools. While of particular value to students aiming for a career in education, these core skills are equally important for any career that requires good communication. Entry to this module is by selection following application and interview during the preceding semester.

Class Hour: Flexible

Teaching: Occasional tutorials and a half-day training session.

Assessment: Continuous Assessment = 100%

