



OLLSCOIL NA GAILLIMHĒ
UNIVERSITY OF GALWAY

Coláiste na hEolaíochta agus na hInnealtóireachta
College of Science and Engineering

Scoil na Ríomheolaíochta
School of Computer Science



OLLSCOIL NA
GAILLIMHĒ
UNIVERSITY
OF GALWAY

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School of Computer Science



1CCS1
Cloud Computing
and Software
Development
Postgraduate Diploma



Springboard+ and HCI Pillar 1
are co-funded by the
Government of Ireland and the
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Postgraduate Diploma in Cloud Computing and Software Development

STUDENT HANDBOOK 2024 – 2025

University of Galway School of Computer Science requires all students to have exclusive use of a laptop for use in lectures and labs, for home use of online materials and for participation in online sessions.

The minimum and recommend spec are detailed at <https://www.universityofgalway.ie/science-engineering/school-of-computer-science/currentstudents/laptops/>.

We also operate a laptop loan scheme for students who cannot afford a suitable laptop (see same address).

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Please note: This handbook is for information only and is correct at time of compilation. However, processes and procedures may change throughout the academic year. Please contact the relevant websites and Administrative Offices for up to date information.

Section 1: Programme Descriptions

Postgraduate Diploma in Cloud Computing & Software Development

The Postgraduate Diploma in Cloud Computing and Software Development provides the skills required in the digital age and has been designed to meet the challenges of reskilling and upskilling in a modern economy. Industry demand for graduates with cloud computing and software development skills is at an all-time high. This course provides flexible delivery options to meet this need. It has been designed in consultation with start-up enterprises, SMEs and large multinationals to give you the expertise and knowledge required to progress your career.

Course Content:

This is a two-year part-time Springboard + online programme with awards of 60 ECTS in total.

This course provides:

- A solid foundation in key computing knowledge, including extensive experience with programming languages such as, Java, Java Enterprise, JavaScript (NodeJS) all at the level expected by industry.
- A specialisation in cloud computing, enabling you to build critical knowledge of cloud application development, as well as cloud infrastructures and platforms such as Firebase and AWS.
- A structure for industry collaboration, which allows industry to influence the development and training of participants, through an upgraded 8-month internship programme.

This programme has been carefully designed in conjunction with 12 industry partners to meet the demands of the sector including, SAP, Channel Mechanics, Schneider Electric, Segotia and Alvaria, Avaya, Cisco, Sidero, The Marine Institute, Insight and CMS Distribution.

Work placement in industry or a group project takes place in semester two of year two. Thus after 18 months of course work, students can be working full-time in a software development role.

Section 2: General Information

2.1 Academic Calendars 2024-2025 and 2025-2026

The Academic Calendars are available on:

<https://www.universityofgalway.ie/registry/academic-term-dates/#d.en.186426>

Academic Year 2024-2025	
Semester 1	
Start of Teaching (UG years (excluding Year 1) and Postgraduate Taught programmes)	Monday 9 th September 2024
End of Teaching all years	Friday 29 th November 2024
Study Week (All Years, UG & PGT)	Monday 2 nd December - Friday 6 th December 2024
Semester 1 Exams	Monday 9 th December – Friday 20 th December 2024
Semester 2	
Teaching (All Years, UG & PGT)	Monday 13 th January – Friday 4 th April 2025
Easter	Good Friday 18th April – Easter Monday 21st April 2025
Field Trips	Monday 7 th April – Thursday 10 th April 2025
Study Week (All Years, UG & PGT)	Friday 11 th April – Thursday 20 th April 2025
Semester 2 Exams	Tuesday 22 nd April – Friday 9 th May 2025
Autumn Repeat Exams	Tuesday 5 th August - Friday 15 th August 2025
Easter Holidays: Good Friday 18th April to Easter Monday 21st April 2025	
Bank Holidays: Monday 28th October 2024 / Monday 3rd February 2025 / Monday 17th March 2025 / Monday 5th May 2025 / Monday 2nd June 2025 / Monday 4th August 2025	

Academic Year 2025-2026	
Semester 1	
Start of Teaching (UG years (excluding Year 1) and Postgraduate Taught programmes)	Monday 8 th September 2025
End of Teaching all years	Friday 28 th November 2025
Study Week (All Years, UG & PGT)	Monday 2 nd December - Friday 6 th December 2024
Semester 1 Exams	Monday 8 th December – Friday 19 th December 2025
Semester 2	
Teaching (All Years, UG & PGT)	Monday 12 th January – Thursday 2 nd April 2026
Easter	Good Friday 3rd April – Easter Monday 6th April 2026
Field Trips	Tuesday 7 th April – Friday 10 th April 2026
Study Week (All Years, UG & PGT)	Monday 13 th April – Friday 17 th April 2026
Semester 2 Exams	Tuesday 21 st April – Friday 8 th May 2026
Autumn Repeat Exams	Tuesday 4 th August - Friday 14 th August 2026
Easter Holidays: Good Friday 3rd April to Easter Monday 6th April 2026	
Bank Holidays: Monday 27th October 2025 / Monday 2nd February 2026 / Tuesday 17th March 2026 / Monday 4th May 2026 / Monday 1st June 2026 / Monday 3rd August 2026	

2.2 Key Contact Details

Programme Director

Programme	Programme Director	Room	E-mail
PG Dip in Cloud Computing & Software Development	Dr. Owen Molloy	CSB-3032	Owen.molloy@universityofgalway.ie

Administrative and Technical Staff

Administrative Staff		Room	E-mail
Ms Gail Cassidy	Programme Administrator	-	ICTskills@universityofgalway.ie
IT Technical Staff			
Mr Peter O’Kane	Chief Technical Officer	CSB-3038	Peter.okane@universityofgalway.ie
Mr Joe O’Connell	Senior Technical Officer	CSB-3037	Joe.oconnell@universityofgalway.ie
Mr Pearse Carroll	Senior Technical Officer	CSB-3037	pearse.carroll@universityofgalway.ie

The School of Computer Science is located in the Computer Science (CS) Building, Floor 3
For directions to the CS Building please click (Ctrl+Click) [here](#)

Student Registry Help Desk

The Student Registry Help Desk provides the following services:

- Admissions, Registration, Exams and Conferring queries
- Prospectus pick up
- Replacement ID Cards
- Exam Transcript requests
- Course Withdrawal / Leave of Absence
- Validation and Stamping of Forms e.g. social welfare, medical card application
- Change of Name/ Change of Address requests
- Registration and Statements
- Employment and verification requests

Student Registry Help Desk: Location: Ground floor, Áras Uí Chathail, which is situated on the main campus. Tel: (091) 495999 / askregistry@universityofgalway.ie

Registered Students can visit the Front Desk service which is open Monday to Friday 9:30am-12:30pm & 1:30pm-4:00pm. Web link for further details as follows:

<https://www.universityofgalway.ie/student-registry-helpdesk/>

Useful Contact Numbers (<http://www.universityofgalway.ie/about-us/contact-us/>)

Student Registry Help Desk	(091) 495999
ISS Help Desk	(091) 495777
Admissions Office	(091) 495999
Accommodation & Welfare Office	(091) 493540
Disability Support Service	(091) 492813
Fees Office	(091) 492386
Health & Safety Office	(091) 492678
Campus Security / Emergency	(091) 493333
Student Counselling	(091) 492484
Student Health Unit	(091) 492604
Students Union Shop	(091) 492411
General Emergency	999 / 112
Local Garda Station	(091) 538 000
Hospital (UHG)	(091) 524222
Samaritans	116 123 (freephone 24/7)

Student Support

For a summary of supports and services available to students please click (Ctrl+Click) [here](#)

College of Science & Engineering Student Support Officer

Kelly Moore is the Student Support Officer in the College of Science & Engineering, and provides support for students during their time at university. The role of the Student Support Officer is to provide confidential, non-judgmental support and an empathetic space for students to share their concerns. In addition, a student advisor can offer personal support and advice on topics such as study planning, time management and any personal challenges that may compromise their ability to study. For further details please visit the following web link: [COSE Student Support Officer - University of Galway](#)

Student Support Officer: Location: Mondays, Wednesdays and Thursdays in Room 218, Arts/Science Concourse Building. Tuesdays in Room 1046, Alice Perry Engineering Building. Fridays available remotely via online meetings.

Direct Tel: 086 0834435 / Email: kelly.l.moore@universityofgalway.ie

2.3 Registration

Online registration opens on **Thursday, 15th August 2024** for postgraduate taught students. Details of relevant dates can be found on: (<https://www.universityofgalway.ie/registration/quick-links/registration-dates/>). Students will receive an email from Registration before online registration opens inviting students to register online. Students should register as soon as possible for their programme and activate their University of Galway campus account (*see point 2.4 below*). Further registration details can be found on: <https://www.universityofgalway.ie/registration/>.

2.4 Activating your University of Galway Campus Account

New students will receive a welcome email "*Activating your new University of Galway campus account*" which will be sent to a student's personal email address following registration.

This email will provide students with a **University of Galway email address** and a **temporary activation password**. It also describes the steps new students need to take to activate their new University of Galway campus account. A campus account will allow students to access [many important services](#) during their time at University of Galway.

Further details on the steps to follow to activate a new student campus account can be found here: <https://www.universityofgalway.ie/information-solutions-services/studentrecordssystem/studentaccess/newstudents/>

For existing students, please follow the steps outlined in the following link: <https://www.universityofgalway.ie/information-solutions-services/studentrecordssystem/studentaccess/existingstudents/>

2.5 Student ID Cards

Students can collect their ID cards from the Student Reghelp Desks, first floor, Áras Uí Chathail from the start of term: <https://www.universityofgalway.ie/registration/quick-links/id-cards/>. Alternatively, students can request their ID card to be posted: <https://www.universityofgalway.ie/registration/quick-links/id-cards/1styearpostgraduatestudentidcarddistribution/>

2.6 Maps

University of Galway Campus maps can be located on the University's website at: <https://www.universityofgalway.ie/buildings/maps/>

2.7 Examinations

Written exams take place on-campus at the end of the teaching semesters (typically in December and April, potentially on a Saturday per occasion). This is an important aspect of the academic integrity of the course, which is necessary for employer confidence in the quality of our graduates.

All exams for **new incoming Year 1 students** are scheduled and conducted by the University's Examinations Office.

All exams for **current students going into Year 2** will be conducted in-house and not via the Examinations Office.

Communication regarding all exams for your course will be provided by the Examinations Office for new incoming Year 1 students and by the course administrator for current Year 2 students via the Canvas VLE; this will include specific exam timetables per semester, venue details, and exam regulations.

Results

Results will **NOT** be given on the telephone to candidates, or to anyone acting on their behalf.

Following formal ratification by the University's Examinations Boards processes, the Examinations Office posts all official results to the home address of each candidate. It is the responsibility of students to ensure that their home address is correct on their record. Click on the link for info on how to [register an address change](#). Please note you must allow 2 weeks for your change of address request to be processed.

Repeat, Appeals and Re-checks

Strict deadlines apply for appeals and re-checks and completed online application forms must be submitted to the Examinations Office by the relevant deadlines as detailed on the website links as follows: <https://www.universityofgalway.ie/exams/results/appeals/>

and <https://www.universityofgalway.ie/exams/results/rechecks/>. A fee must be lodged with both the Appeal and Re-check Forms. Fees are refunded if the outcome is positive. Further detailed information is provided in the above links.

Exam Board Sittings

The examinations board will sit in June and October where relevant examination, project and theses grades will be processed by the College of Science & Engineering.

Deferral of Exams

A guide for exam deferrals is available at: <https://www.universityofgalway.ie/exams/timetable-advice/deferrals/>. This guide is to assist students with the process and provides a direct link to the College of Science & Engineering's Specific Deferral Form.

2.8 Student Services

Coming to University is a major milestone in your life and a point of changeover in your life. You are facing into some challenges and many opportunities. You will encounter the enjoyment and challenges of independence and decision-making and responsibility for your own well-being and lifestyle.

Student Services is a team that are core to the personal and academic development of students. Student Services is under the management of the Vice President for the Student Experience. Student Services is committed to enhancing the individual student experience by providing an excellent service which supports the holistic development of the person, thereby enabling each student to achieve their full academic potential. Through valuing, recognising and supporting each staff member and by forging strong alliances within the University Community, Student Services will assist University of Galway to become a truly Student Centred University.

Student Services provides many services as follows:

- Access Centre; Career Development Centre; Societies and Sports; Welfare and Wellbeing.

Further detailed information and contact details on all the Student Services offered by University of Galway may be found at: <https://www.universityofgalway.ie/student-services/>.

2.9 Student Counselling

The counselling service is part of a network of support services offered by University of Galway. It provides professional counselling, which is **free** and **confidential** to all students of University of Galway. Life as a student is exciting and challenging, an achievement usually gained after much hard work and preparation. It can also be stressful at times. You may find you are experiencing personal difficulties which are affecting your ability to study and to take full advantage of the opportunities available to you at University of Galway. This is where student counselling can help. Student counselling are a team of qualified and

experienced counsellors and psychotherapists. The service operates within the Code of Ethics and Practice agreed by their respective accrediting bodies including IACP, IAHIP and PSI. The services provided include:

- Pre-counselling assessment, individual counselling and psychotherapy
- Group work
- Information and referral
- A consultation service for those who may have concerns about a student.

Further information including available online services and emergency contact details can be located on the following weblink: <https://www.universityofgalway.ie/counsellors/>

Counselling Services: Location: No. 5 Distillery Road, University of Galway
Direct Tel: (091) 492484 ext. 2484
E-mail: counselling@universityofgalway.ie

2.10 Computer Science Account and Swipe Card Access to Labs

The School of Computer Science has several undergraduate and postgraduate rooms which are available for use by our students. The rooms have hot swap desks, with laptop docking stations allowing use of external monitor, keyboard, mouse and the high-speed network. Students must provide their own laptops <https://www.universityofgalway.ie/science-engineering/school-of-computer-science/currentstudents/laptops/>. All students who are taking a module/course with the School of Computer Science are entitled to use the open access labs in the CS Building outside of scheduled timetable use (Note: CSB-G001 is available to all University of Galway students using main University of Galway account). Depending on their course, they may also have swipe card access to further project rooms in the CS Building.

Computer Science students are also given access to print on our shared printers, and to use our web and database servers which can be used for course or project work. To gain access to these resources, students will be given Computer Science accounts automatically after a student registers for one of our modules/courses, and students will receive an email to their University of Galway email to indicate the account is ready for use. The initial password is included in the email. Students can login to our intranet to setup the web/database/linux resources <https://web1.cs.universityofgalway.ie/intranet/>

Students who have issues with their Computer Science computer account, docking stations, monitors or swipe card access in the Computer Science Building should log a call to Computer Science Technical officers at: support@cs.universityofgalway.ie. Useful links for further related info: <https://www.universityofgalway.ie/science-engineering/school-of-computer-science/currentstudents/>.

Students who have issues with their main University of Galway account, Wi-Fi, Canvas, personal laptops or any PC/printer on the rest of campus should refer to the University of Galway

helpdesk: <https://www.universityofgalway.ie/information-solutions-services/services-for-students/>.

2.11 DISC - Computer Programming Drop-In Support Centre

Computer DISC is a Computer Programming Drop-In Support Centre for all University of Galway students who are taking any programming/software development courses. The DISC is a free service that supports all students with their self-directed learning in computing topics at all years and levels in University of Galway. The centre is located in Room 205 on 1st floor of the Computer Science (CS) Building - <https://www.universityofgalway.ie/science-engineering/school-of-computer-science/currentstudents/computerdisc/>

What services does Computer DISC provide to students?

- Facilities for students to sit and work on programming problems
- One-to-one advice and support for students, and focused small group tutorials
- Books, courseware, web links, and other learning resources for programming students
- A website with information and an email service for all queries
- Advice for students who wish to learn new programming languages autonomously
- Assistance with new technologies for project work such as Final Year Projects

2.12 Canvas

Canvas is the Virtual Learning Environment (VLE) at University of Galway. Canvas is a modern, user-friendly VLE that allows students to access learning materials, reading lists, assessment information and other course-related content.

<https://universityofgalway.instructure.com/>

When a student registers for a course or module with the University of Galway, they are automatically enrolled on the corresponding course on Canvas. Enrolments are recognised by Canvas within 24 hours of registration. If students have problems accessing Canvas, they should contact the Library and IT Service Desk. The Service Desk can assist students with queries regarding problems with their password, e-mail account or logging in to Canvas.

If students are unable to see courses when they log into Canvas, they will need to check their registration statement to ensure they are correctly registered. Within Canvas, University of Galway students have access to 24x7x365 support via the Help menu. This Canvas support team can answer most queries related to the Canvas environment including how to submit assignments, how to see the gradebook, and where to access course materials. They also provide advice on how Canvas features can be used.

2.13 Plagiarism

Plagiarism refers to copying another author's work without due reference or acknowledgement of the author. Plagiarism is not acceptable. It is essential that the candidate acknowledge other

people's work, when used by the student. The submitted work must be prepared by the candidate alone, and must be the result of the candidate's own effort, skills and knowledge. It is unacceptable for candidates to knowingly permit others to copy their work. University of Galway has a strict code of practice for dealing with plagiarism, please refer to the following link for further details: <https://www.universityofgalway.ie/plagiarism/>.

2.14 Information Solutions and Services (ISS)

ISS aim to provide students with access to the ICT facilities which they need to succeed in their studies at University of Galway. These facilities include high speed Internet access, a University of Galway email account, access to the resources of the James Hardiman Library and assist with accessing Canvas, the virtual learning environment. These services are accessible from the on-campus PC suites and from suitably equipped laptops using the on-campus wireless network.

A Campus Account (CASS) provides students access using a single User ID and Password to all computing services, other than E-mail. To activate your Campus Account (*see paragraph 2.4 above*), students should follow the instructions as outlined in the following weblink: <https://www.universityofgalway.ie/information-solutions-services/studentrecordssystem/studentaccess/>.

ISS Service Desk: Location: Ground floor of the James Hardiman Library

E-mail address: servicedesk@universityofgalway.ie

Direct Phone: (091) 495777 or the Library & I.T. Service Desk: (091) 495399

2.15 Career Development Centre

As part of the Postgraduate Diploma in Cloud Computing and Software Development's work placement/internship module CT5179 (Year 2, Semester 2), Aisling O'Hara, Placement Officer with the Career Development Centre - placement@universityofgalway.ie - will liaise with students on the process involved to secure placements etc.

The Career Development Centre provides students of University of Galway with a quality career guidance and information service focused on facilitating and empowering students to manage their own career development and empowering students to make successful transitions towards fulfilling careers. Details of the services provided to students by the Career Development Centre include:

Guiding students in their career journey through:

- One-to-one career guidance
- Career seminars and events
- Psychometric testing
- Dedicated careers information hub for students (on-campus and virtual)
- Self-guided modules

Connecting students with employers through:

- Jobs fairs and employer events
- Job vacancy system
- Networking opportunities

Helping students to compete in the jobs market to the best of their ability through:

- CV workshops, e-learning, and unlimited AI feedback
- Interview skills workshops, e-learning, and software to practice and improve
- Applications advice: including Postgraduate and Job Applications
- Employment skills workshops and employability award

Further information on the range of services provided by the Careers Development Centre can be found at: <https://www.universityofgalway.ie/career-development-centre/>.

Career Development Centre: Location: Arts/Science Building (1st Floor)

Tel: (091) 493589

2.16 Out of Hours Working

Out of hours work refers to all University operations conducted outside normal hours.

For up to date details on the University's Safety Statement Policy and Out of Hours Working, please click on the following web link: [University of Galway Safety Statement](#).

2.17 Parking on Campus

Parking spaces in University of Galway fall into a number of categories:

- Staff Only; Student Only; Shared use (staff & student permit holders); Visitor/non-permit holder; Pay-and-display/Pay by Phone (P&D) spaces; "Reserved" spaces and loading bays.

Student parking permits are available for registered students, details as below.

To purchase/renew your Student Parking Permit carefully read the instructions contained in the following guide [PermitApplicationsGuide2024](#) then visit the [Online Payment System](#) to book your permit.

If you park in a "Pay and Display" space, you must buy a ticket from the nearby machines or use the Pay by Phone option and display your ticket on your dashboard face up, regardless of what other type of permit you might have. If you buy a P&D ticket you can only park in spaces marked with blue lines and text ("P&D/í&T").

A park and ride service operates from Dangan car park. Further information and timetable details are available from: [Park & Ride Bus Timetable](#)

Parking at University of Galway is operated by APCOA Ireland. If you have a parking related query please contact: Ireland.permits@apcoa.ie or telephone: 0818 462899.

2.18 Library

The Student ID card also acts as a Library card. Students must have a current card in order to gain entrance to the Library. Details on the services provided by the library are available at: [About - University of Galway](#). The Library and IT Service Desk is located on the ground floor of the library and provides advice and support to students on both Library and IT services (e.g., User ID/passwords, book loans, printing Wifi access).

2.19 Module Descriptions

Year 1

CCS1	Modules	Year 1 (30 Credits)	
Core	CT5167: Cloud Web Application Development	Semester 1	Credits: 5
Core	CT5175: Algorithmics & Logical Methods	Semester 1	Credits: 5
Core	CT5177: Programming I	Semester 1	Credits: 5
Core	CT5168: Enterprise Java Programming	Semester 2	Credits: 10
Core	CT5169: Fundamentals of Cloud Computing	Semester 2	Credits: 5

Year 2

CCS1	Modules	Year 2 (30 Credits)	
Core	CT5171: Cloud DevOps	Semester 1	Credits: 5
Core	CT5176: Databases	Semester 1	Credits: 5
Core	CT5178: Computing Architecture & Operating Systems	Semester 1	Credits: 5
Core	CT5179: Internship or Capstone Cloud Computing Group Project	Semester 2	Credits: 15

CT5167: Cloud Web Application Development

This module will cover the fundamentals of web programming, starting with frontend technologies HTML and CSS including a design framework such as Bootstrap. Backend development will include NodeJS and a document driven database. The cloud deployment platform Firebase will be used to host the developed applications, the database, enable

authentication as well as deploy APIs. The goal is to be able to build a fully functional live, database driven web application upon completion which is deployed on the cloud.

CT5175: Algorithmics & Logical Methods

This module is delivered in two distinct half's that each last 6 weeks. Over the first 6 weeks, the module is designed to assist students that are new to programming and initially mirrors many of the concepts covered in Java Programming. Topics include structured programming, pseudocode, algorithmic design and complexity. Sorting algorithms are covered in detail with a significant assignment associated with assessing the ability of students to understand a complex sorting challenge, design a suitable algorithm and explain the overall complexity and design of their solution. In the second half of the module a range of concepts around searching are covered via a range of practical examples and leveraging core computer science concepts.

CT5177: Programming I

Introduction to Object Oriented Programming using the Java programming language. No background in Java is expected, topics include: Classes, Objects, Methods, Data Types, Variables, Operators and Control Statements, Inheritance, Polymorphism amongst others. There will be weekly labs with assignments. At the end of the module the student will be proficient in the basic workings of the Java Programming Language and the runtime environment.

CT5168: Enterprise Java Programming

Understand and describe the architecture and components of Enterprise Java software systems, selected tools, frameworks and concepts for the development of Enterprise Java software systems. Analyse, create and debug Enterprise Java software. Explore advanced Java concepts (such as polymorphism, collections, complex class relations and types, generics, networking and client/server, I/O, concurrency, GUIs) Create and analyse Java programs involving concepts such as polymorphism, collections, complex class relations and types, generics, networking and client/server, I/O, concurrency, GUI frameworks.

CT5169: Fundamentals of Cloud Computing

This module will cover fundamental concepts of modern infrastructure cloud environments. This will include Virtualisation what it is and its role in modern cloud infrastructures. Containerisation technologies such as Docker, Kubernetes, will be covered in detail as well as their role in modern software development with practical exposure to the technologies. In addition, Proxmox and/or OpenStack as well as Load Balancing strategies for deployed applications in the cloud will be covered. Finally, MapReduce Clusters (Hadoop), Storage Area Networks, CEPH clusters and serverless will be included in the syllabus. This may change given the dynamic nature of cloud platforms with technologies still emerging each year. Upon completion of the module the student will have a thorough understanding of core technical cloud concepts and the technologies in broad use within industry today.

CT5171: Cloud DevOps

DevOps is a methodology which includes Development (Dev) and Operations (Ops) in order to increase the speed, efficiency and security of software development. It comprises a range of tools and practices for automating much of the development lifecycle. These include continuous integration/delivery, test automation, integration of version control, build pipelines, security concerns. Upon completion the student will understand how to develop software within this methodology and gain exposure to the tools and practices that are used in modern day industry software development.

CT5176: Databases

This module will provide the student with the information and technical know-how to establish, manage and optimally use databases. This is a relational databases module where MySQL will be the core database technology used. Typical database concepts such as Tables, Queries, Keys, Normalisation, Joins etc. will be covered. This will be essential information for those interested in Clinical Research administration or data science.

CT5178: Computing Architecture & Operating Systems

This module explores basic organisation and types of computer systems. Important processor architectures. Outlines the basic structure and operation of microprocessors. Key features and operations of digital circuits and memory systems. Input/output operations and components. Understand and describe the purpose, organisation and main features of an operating system. Research the main requirements and operations of operating systems. Foundational process management (including scheduling and concurrency) Understand memory-, file system-, storage- and I/O device-management. Learn basic security requirements in the context of operating systems.

CT5179: Internship or Capstone Cloud Computing Group Project

For this module students will undertake either an 8 months internship (Jan to Aug) with an industry partner or a large capstone group project. Recognition is also given for specific company training and/or certification. The internship is evaluated through weekly learning journals and completion reports, including a written report, presentation and industry supervisor appraisal. Each group project team is assigned an academic supervisor, and is assessed through a number of deliverables during the project, as well as a final presentation / demonstration and written report. The module is compulsory and must be passed to pass the programme.