



OLLSCOIL NA GAILLIMHE
UNIVERSITY OF GALWAY

Coláiste na hEolaíochta agus na hInnealtóireachta
College of Science and Engineering

Scoil na Ríomheolaíochta
School of Computer Science



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College of Science and Engineering



1CSS1
Cybersecurity
and Software
Development
Postgraduate Diploma

cs.UniversityofGalway.ie

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Postgraduate Diploma in Cybersecurity and Software Development

STUDENT HANDBOOK 2023 - 2024

(version 2)

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 recommended 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 Cybersecurity and Software Development

The Postgraduate Diploma in Cybersecurity and Software Development programme is designed to prepare students for the demands of the digital age by reskilling and upskilling them in Cybersecurity while simultaneously training them for software development. Graduates of this programme will be able to bridge the gap between software development and security teams.

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, at industry level;
- A specialisation in Cybersecurity making participants aware of cyber threats, vulnerabilities and attacks, threat models, secure software development (DevSecOps), Crypto API, including programming languages such as, Java, Java Enterprise, JavaScript (NodeJS) and Python;
- A structure for industry collaboration, which allows industry to influence the development and training of participants, through a dedicated 8 month internship programme.

This programme has been carefully designed in consultation with industry partners (Cybersecurity companies) including Rapid 7, Cisco, IBM, HPE, TitanHQ, on the advice of the regional skills fora and informed by discussions within the ITAG Cyber Forum.

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 2023-2024 and 2024-2025

The Academic Calendars are available on:

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

Academic Year 2023-2024	
Semester 1	
Start of Teaching (UG years (excluding Year 1) and Postgraduate Taught programmes)	Monday 4 th September 2023
End of Teaching all years	Friday 24 th November 2023
Semester 1 Exams	Monday 4 th December – Friday 15 th December 2023
Semester 2	
Teaching (All Years, UG & PGT)	Monday 8 th January – Thursday 28 th March 2024
Easter	Good Friday 7th April - Easter Monday 10th April 2024
Field Trips	Tuesday 2 nd April – Friday 5 th April 2024
Study Week (All Years, UG & PGT)	Monday 8 th April – Friday 12 th April 2024
Semester 2 Exams	Monday 15 th April – Wednesday 1 st May 2024
Autumn Repeat Exams	Tuesday 6 th August - Friday 16 th August 2024
Easter Holidays: Good Friday 29th March to Easter Monday 1st April 2024	
Bank Holidays: Monday 30th October 2023 / Monday 5th February 2024 / Sunday 17th March 2024 / Monday 1st April 2024 / Monday 6th May 2024 / Monday 3rd June 2024 / Monday 5th August 2024	

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
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 1st April 2025/ Monday 5th May 2025 / Monday 2nd June 2025 / Monday 4th August 2025	

2.2 Key Contact Details

Programme Director

Programme	Programme Director	Room	E-mail
PG Dip in Cybersecurity & Software Development	Dr. Mamoon Asghar	432	Mamoon.asghar@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	435	Peter.okane@universityofgalway.ie
Mr Joe O’Connell	Senior Technical Officer	434	Joe.oconnell@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 Advisor in the College of Science & Engineering, and provides support for students during their time at university. The role of the Student Advisor 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: <https://www.universityofgalway.ie/cosestudentadvisor/>

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 17th August** 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 Maps

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

2.6 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 are conducted in-house, and the University's Examinations Office is not involved in same. Communication regarding exams for your course will be provided by the course administrator 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 as follows: [College of Science & Engineering](#).

2.7 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/>.

2.8 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

2.9 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: IT 106 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/>.

2.10 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

2.11 Canvas

Canvas is the new 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.

2.12 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/> - scroll down to *QA220 Academic Integrity Policy*.

2.13 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, and 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: Foyer of the James Hardiman Library

E-mail address: servicedesk@universityofgalway.ie

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

2.14 Career Development Centre

As part of the Postgraduate Diploma in Cybersecurity and Software Development's work placement/internship module CT5179 (Year 2, Semester 2), Grainne Carey, Placement Officer with the Career Development Centre - grainne.carey@universityofgalway.ie - will liaise with students on the process involved to secure placements.

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: +353 (0)91 493589

2.15 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](#)

2.16 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 [Parking Permit Applications Guide 23-24](#) 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/I&T").

A park and ride service operates from Dangan car park. Further information and timetable details are available from: [Park & Ride Bus Timetable 2023](#)

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.

2.17 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 <https://library.universityofgalway.ie/usingthelibrary/accessingthelibrary/>. 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).

Information on the Library online and remote services available can be found on: <https://library.universityofgalway.ie/usingthelibrary/oneservices/>.

2.18 Module Descriptions

Year 1

CSS1	Modules	Year 1 (30 Credits)	
Core	CT5172: Cybersecurity Essentials	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	CT5173: Secure Web Programming	Semester 2	Credits: 5

Year 2

CSS1	Modules	Year 2 (30 Credits)	
Core	CT5174: Applied Cybersecurity	Semester 1	Credits: 5
Core	CT5176: Databases	Semester 1	Credits: 5
Core	CT5178: Computing Architecture & Operating Systems	Semester 1	Credits: 5
Core	CT5180: Internship or Capstone Cybersecurity Group Project	Semester 2	Credits: 15

CT5172: Cybersecurity Essentials

The module covers the importance of cybersecurity, awareness, data confidentiality, and appropriate practices when using cyberspace. In this module, learners are taken through every aspect of cybersecurity and are explained why personal and organizational data should be protected. It covers foundational knowledge in all aspects of security in the cyber world, including information security, systems security, network security, mobile security, physical security, and privacy protection laws. Learners are exposed to related technologies, procedures, mitigation strategies, and defence tactics used by organizations to ensure their security.

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.

CT5173: Secure Web Programming

The module introduces the learners to the theory and practice of secure web application development using programming language(s). The module enables learners to analyse, compare, and critically assess common vulnerabilities of web applications with a view to identifying countermeasures to prevent such vulnerabilities from being exploited. An assessment of the tools and techniques used in attacking web applications and the use of those tools and techniques to strengthen the security of web applications is performed.

CT5174: Applied Cybersecurity

The purpose of this module is to facilitate the learners in understanding and practicing secure software development lifecycles (SecDevOps) using different libraries/APIs of programming languages. It enables learners to gain a comprehensive understanding of the principal cryptography concepts and mechanisms, including how these mechanisms can be applied, individually and in combination, to build secure development operations.

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.

CT5180: Internship or Capstone Cybersecurity Group Project

For this module students will undertake either an 8 month 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. This internship is evaluated through weekly learning journals and completion reports. The module is compulsory and must be passed to pass the programme.