## Module Catalogue Computer Science and Engineering Undergraduate Study Abroad 2024/5 Semester 2

| **Module Code** | **Module Name** | **Level** | **Semester** | **UK Credit Value** | **Credit Equivalency** |
| --- | --- | --- | --- | --- | --- |
| **Computer Science and Engineering** | | | | | |
| 4BUIS001W | [Business Information Systems Concepts](#4BUIS001W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4BUIS003W | [Requirements Modelling](#4BUIS003W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4COSC005W | [Software Development II](#4COSC005W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4COSC011W | [Web Design and Development](#4COSC011W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4DATA001W | [Statistical Modelling and Analysis](#4DATA001W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4ELEN002W | [Computer Organisation and Digital Systems](#4ELEN002W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4NTCM002W | [Introduction to Networks](#4NTCM002W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 4NTCM005W | [Programming Methodology II](#4NTCM005W) | 4 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 5BUIS018W | [BIS Development](#5BUIS018W) | 5 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 5CCGD010W | [Maths and Physics for Games](#5CCGD010W) | 5 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 5COSC024W | [Server-Side Web Development](#5COSC024W) | 5 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 5DATA002W | [Machine Learning and Data Mining](#5DATA002W) | 5 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 5SENG003W | [Algorithms: Theory, Design and Implementation](#5SENG003W) | 5 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 6BUIS018W | [Information Driven Entrepreneurship and Enterprise](#6BUIS018W) | 6 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 6COSC019W | [Cyber Security](#6COSC019W) | 6 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |
| 6MARK017W | [Digital Marketing, Social Media and Web Analytics](#6MARK017W) | 6 | Semester 2 | 20 | US Credits 4 / ECTS credits 10\* |

\* All transcripts are issued in UK credits. Please note the recommendation of a 4 US credit value equivalency is provided as guidance. Final credit values for all modules for US students are decided by your home institution and will be dependent on its credit transfer policies.

## Computer Science and Engineering

### Business Information Systems Concepts

[**Module Code: 4BUIS001W**](#4BUIS001W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

The aim of the module is to provide students with the theoretical background of how information systems are used in the world of business. Students will get an overview of the main aspects of business and related functions including business in the global economy, small business and the entrepreneur and online business and technology. This module will also address ethical and legal issues as well as corporate social responsibility of businesses. This module will also explore the use of information systems in production operations and supply chain management, product development, and e-marketing.  
**Assessment:** Coursework Group (50%), Coursework (50%)  
\*All transcripts are issued in UK credits.

### Requirements Modelling

[**Module Code: 4BUIS003W**](#4BUIS003W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module aims to introduce students to the concepts of software requirements and the activity of visual modelling for the purposes of requirements specification in software development. The students will learn the fundamental concepts and theories relating to requirements elicitation as well as some of the tools and techniques that are used to elicit and model requirements. The students will develop the ability to form, represent and communicate abstract models and use this skill and the knowledge gained from the module for specifyinguser and systems requirements for information systems.  
**Assessment:** Coursework Group (40%), In-Class Test/Assignment exam conditions (60%)  
\*All transcripts are issued in UK credits.

### Software Development II

[**Module Code: 4COSC005W**](#4COSC005W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 1 module of programming (any language).***  
The module aims to develop skills in the selection and implementation of problem-solving algorithms while learning the Java programming language. It will strengthen abilities in the implementation of algorithms, in terms of adherence to requirements, design and modelling, through to the application of sound programming principles. The understanding of structures and advanced programming methods will also be developed, including sorting, the implementation of classes and methods, as well as more sophisticated data structures such as lists, queues, and stacks.  
**Assessment:** Coursework (50%), Lab-Based Practical (50%)  
\*All transcripts are issued in UK credits.

### Web Design and Development

[**Module Code: 4COSC011W**](#4COSC011W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module introduces web technologies and covers theoretical and practical concepts of web development. It covers a variety of commonly used Internet programming languages. Students will gain practical experience of Web page development, and will be expected to write programs and Web pages conforming to given guidelines.  
**Assessment:** Coursework Group (50%), Lab-Based Practical (50%)  
\*All transcripts are issued in UK credits.

### Statistical Modelling and Analysis

[**Module Code: 4DATA001W**](#4DATA001W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module introduces the fundamental ideas of classical statistics. It covers descriptive statistics, the estimation of population moments using data and the basic ideas of statistical inference, hypothesis testing and interval estimation. It lays out the foundation for level 5 modules. Hence the topics such as data collection, data clearing and data ethics are also covered.  
**Assessment:** Coursework Group (60%), In-Class Test/Assignment exam conditions (40%)  
\*All transcripts are issued in UK credits.

### Computer Organisation and Digital Systems

[**Module Code: 4ELEN002W**](#4ELEN002W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

To give an understanding of and fluency in combinational and sequential logic techniques used in the design of general digital systems; to gain familiarity with the building blocks and organisation of digital microcontrollers; to gain experience in programming of microprocessors in an assembler language.  
**Assessment:** In-Class Test/Assignment exam conditions (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Introduction to Networks

[**Module Code: 4NTCM002W**](#4NTCM002W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module provides an in depth understanding of the infrastructure of computer networks in terms of design, logical organisation, protocol structures and physical connections. Gives theoretical and practical insight into the computer communication networks and review the most important network technologies. The laboratory exercises are designed to support the lectures.  
**Assessment:** Lab-Based Practical (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Programming Methodology II

[**Module Code: 4NTCM005W**](#4NTCM005W_return)

**Level 4**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 1 module of programming (any language).***  
This module develops skills and confidence for designing, coding and testing small-scale programs in C++. The module introduces awareness of the roles of data structures and algorithms as well as the basic concepts of functions including function passing parameters and local/global variables. Students will learn how to design data abstractions and implement them in the object-oriented programming language C++ using user-defined data types, classes and appropriate input/output. The practical work develops further the problem-solving methodology starting from a complete or partial specification and producing a working program that fulfils the specification.  
**Assessment:** Set exercises and test (not exam conditions) (30%), Set exercises and test (not exam conditions) (30%), In-Class Test/Assignment non exam conditions (40%)  
\*All transcripts are issued in UK credits.

### BIS Development

[**Module Code: 5BUIS018W**](#5BUIS018W_return)

**Level 5**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 2 modules of programming (any language).***  
The aim or this module is to equip students with an in-depth understanding of the object-oriented paradigm. They will acquire the required theoretical knowledge as well as practical tools that will allow them to develop object-oriented web-based solutions for BIS. Students will learn how to undertake analysis, the design and the development of business systems using object-oriented principles in order to produce quality systems in a productive way. Furthermore, students will learn a tool that will allow them to create web-based object-oriented programming applications.  
**Assessment:** Coursework (60%), In-Class Test/Assignment exam conditions (40%)  
\*All transcripts are issued in UK credits.

### Maths and Physics for Games

[**Module Code: 5CCGD010W**](#5CCGD010W_return)

**Level 5**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 1 module that used a Game Engine.***  
This module covers the core physics and mathematical principles that are typically required for the creation of games or other scientific applications that implement realistic physical behaviour of objects. The module covers the necessary classical mechanical principles and mathematical techniques required to simulate the physics of games objects in a high-level language. It also relates this material to the utilisation of game-based physics engines.  
**Assessment:** In-Class Test/Assignment exam conditions (30%), Coursework (70%)  
\*All transcripts are issued in UK credits.

### Server-Side Web Development

[**Module Code: 5COSC024W**](#5COSC024W_return)

**Level 5**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 1 Web Design module.***  
This module covers the design and implementation of commercial dynamic web applications from a server-side programming and database perspective. It is suitable for students with a strong interest in SQL, web programming, HTML, CSS and browser scripting. A server-side language is covered to the depth required for implementing high-quality fully functional web-enabled database applications that fittingly support an organisation’s business processes.  
**Assessment:** In-Class Test/Assignment exam conditions (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Machine Learning and Data Mining

[**Module Code: 5DATA002W**](#5DATA002W_return)

**Level 5**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Know Python (language).***  
This module provides an understanding and hands-on experience in the fields of machine learning and data mining, covering the full life-cycle from preparing data to validating and optimising the learned model. The module covers different algorithms and approaches to machine learning and data mining, and the issues of using them on data sets of different sizes and complexity.  
**Assessment:** Examination - closed book (40%), Coursework (60%)  
\*All transcripts are issued in UK credits.

### Algorithms: Theory, Design and Implementation

[**Module Code: 5SENG003W**](#5SENG003W_return)

**Level 5**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

***Pre-requisite: Attended and passed 2 modules of programming (any language).***  
Algorithms are among the fundamentals of computer science and software engineering and at the heart of artificial intelligence, machine learning, data science and their applications to real world problem solving in digital humanities, economics, biosciences, social sciences, etc. The module introduces the students into the theory and practice of algorithmic strategies, development and implementation. Hence, the module equips the students with a road map of mappings between real world problems and suitable algorithmic approaches for their solutions. The latter is crucial for the students’ professional life as problem solvers and thinkers in IT industry, society and humanity.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Information Driven Entrepreneurship and Enterprise

[**Module Code: 6BUIS018W**](#6BUIS018W_return)

**Level 6**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module will present and analyse major developments and issues in entrepreneurship and enterprise, underpinned and supported by information communication technologies, especially by the Internet, enterprise systems and cloud computing. It will also encourage a mind-set in creative thinking in seeking opportunities for new information driven start-ups and provide a critical assessment of their impact.  
**Assessment:** Portfolio (50%), Portfolio (50%)  
\*All transcripts are issued in UK credits.

### Cyber Security

[**Module Code: 6COSC019W**](#6COSC019W_return)

**Level 6**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

This module examines various aspects of computer and network security giving a sound introduction to theoretical and practical areas such as network security, cryptography, attack vectors used by hackers, security architecture, methodologies for security hardening and defence and penetration testing strategies. A substantial amount of work will be laboratory based involving the deployment of security tools, the hardening of operating systems and the analysis of compromised systems.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Digital Marketing, Social Media and Web Analytics

[**Module Code: 6MARK017W**](#6MARK017W_return)

**Level 6**

**Semester 2**

**Location: Cavendish**

**UK Credit Value: 20**

**Equivalent Credit Value: US Credits 4 / ECTS credits 10\***

The module addresses the requirements and opportunities of the burgeoning Search Engine Optimisation (SEO), Digital Marketing, Social Media and Web Analytics industry by exposing students to the theory and practice of the field. This module gives theoretical and practical knowledge of how to effectively promote an interactive multimedia product (including web pages) in terms of SEO, email marketing, and social media marketing. It discusses different web marketing models and compares them with traditional marketing models. Furthermore, this module discusses security and privacy issues in relation to web analytics and social media.  
**Assessment:** Coursework (50%), Coursework (50%)  
\*All transcripts are issued in UK credits.