## Module Catalogue Computer Science and Engineering Undergraduate Study Abroad 2024/5 Semester 1

| **Module Code** | **Module Name** | **Level** | **Semester** | **UK Credit Value** | **Credit Equivalency** |
| --- | --- | --- | --- | --- | --- |
| **Computer Science and Engineering** | | | | | |
| 4CCGD005W | [Game Design and Asset Creation](#4CCGD005W) | 4 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5BUIS017W | [BIS Design and Architecture](#5BUIS017W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5BUIS020W | [Information Technology Security](#5BUIS020W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5CCGD012W | [Game Programming Patterns](#5CCGD012W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5COSC020W | [Database Systems](#5COSC020W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5DATA005W | [Data Engineering](#5DATA005W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5DATA006W | [Data Visualisation and Communication](#5DATA006W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 5SENG007W | [Software Engineering Principles and Practice](#5SENG007W) | 5 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6BUIS017W | [Customer Relationship and Change Management (CRM & CM) with Business Intelligence](#6BUIS017W) | 6 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6BUIS019W | [Strategic Management of Information Systems](#6BUIS019W) | 6 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6COSC020W | [Applied AI](#6COSC020W) | 6 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6MMCS009W | [Usability Testing and Evaluation](#6MMCS009W) | 6 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6SENG005W | [Formal Methods](#6SENG005W) | 6 | Semester 1 | 20 | US Credits 4 / ECTS credits 10\* |
| 6SENG006W | [Concurrent Programming](#6SENG006W) | 6 | Semester 1 | 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

### Game Design and Asset Creation

[**Module Code: 4CCGD005W**](#4CCGD005W_return)

**Level 4**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

The module provides a comprehensive exploration of game design by integrating theoretical concepts with practical skills crucial for the dynamic digital games industry. It equips students with a multi-disciplinary skill set, encompassing game design principles, rule creation, proficiency in asset creation tools, and a deep understanding of game art and narrative. In addition, this module introduces Equality, Diversity, and Inclusion (EDI), ethical considerations, social awareness, and Intellectual Property (IP) aspects into the curriculum applicable on game design and considerations on final project documentations. Students will not only develop technical prowess but also cultivate a strong sense of responsibility. Moreover, the module emphasizes teamwork, fostering collaboration and preparing students for industry scenarios by exposing them to pre-determined requirements, mirroring the conditions they are likely to encounter post-university.     
**Assessment:** Coursework Group (50%), Practical Work (50%)  
\*All transcripts are issued in UK credits.

### BIS Design and Architecture

[**Module Code: 5BUIS017W**](#5BUIS017W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

The module aims to equip students with a thorough understanding of systems architecture and design techniques which are necessary for the successful development of information systems. Students will learn about interaction design as well as the organization of system components. User interface design will be covered, starting with the basic principles of interface design and continuing to more specific requirements of the design of business information interactive systems. Furthermore, enterprise systems will be discussed and students will learn how to identify and deploy technologies for enterprise-scale solutions. Through the promotion of group work, the module will enable students to become functional members of working teams, emulating the complex environment systems analysts operate in.  
**Assessment:** Coursework Group (60%), In-Class Test/Assignment exam conditions (40%)  
\*All transcripts are issued in UK credits.

### Information Technology Security

[**Module Code: 5BUIS020W**](#5BUIS020W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

This module examines the issues involved with recognising security threats to computer systems, their consequences and methods of dealing with such threats. In particular, it provides an overview of access controls, software development security, business continuity, legal issues and compliance, and physical security.  
**Assessment:** Coursework Group (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Game Programming Patterns

[**Module Code: 5CCGD012W**](#5CCGD012W_return)

**Level 5**

**Semester 1**

**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 covers object-oriented principles from a games development point of view. This includes object-oriented analysis and design, from the initial problem description to the creation of UML class diagrams. The designs are implemented using a standard object-oriented language, chosen according to trends in games development; the module introduces the necessary aspects of object-oriented programming, including features such as encapsulation, sub-classing, and templates/generics. Design patterns and design principles such as SOLID will be introduced and used to show how to create a robust and versatile solution. More advanced topic such as thread-based concurrency will also be touched upon.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Database Systems

[**Module Code: 5COSC020W**](#5COSC020W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Exchange applicants - for students from Westminster International University of Tashkent only.***  
This module provides solid knowledge and skills in the area of database systems, SQL and XML. It covers the logical design of a relational schema. It also covers the implementation of the database in a major DBMS and the manipulation of the data using SQL. Subsequently, it considers the transformation and rendering of XML documents using XSLT and the extraction of elements from XML documents using XPath and XQuery. Finally, it explores issues related to NoSQL databases and XML databases.  
**Assessment:** Coursework (40%), Examination - online (60%)  
\*All transcripts are issued in UK credits.

### Data Engineering

[**Module Code: 5DATA005W**](#5DATA005W_return)

**Level 5**

**Semester 1**

**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 provides an applied understanding and practical experience of the data engineering pipeline to gather, understand, combine, clean, process and store data for further analysis. The module explores data pre-processing strategies and focus on both structured and unstructured data. Furthermore, the module covers issues related to data quality and governance, and metadata management.   
**Assessment:** Coursework (50%), Coursework (50%)  
\*All transcripts are issued in UK credits.

### Data Visualisation and Communication

[**Module Code: 5DATA006W**](#5DATA006W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

This module enables students to create engaging data visualisations to effectively communicate results of data analysis to a diverse audience. Students will learn how to encode information in visual form and will create infographics and dashboards. Students will also learn to use the power of storytelling to create engaging data narratives. We are using a mixture of open source tools, such as R and ggplot2 and commercial tools, like Microsoft Power BI.   
**Assessment:** In-Class Test/Assignment exam conditions (30%), Portfolio (70%)  
\*All transcripts are issued in UK credits.

### Software Engineering Principles and Practice

[**Module Code: 5SENG007W**](#5SENG007W_return)

**Level 5**

**Semester 1**

**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 covers fundamental principles of software engineering. This includes methods for systematically designing, implementing, validating and maintaining sustainable software as part of a realistic development process. The module introduces necessary aspects such as software lifecycles, structured design, systematic testing, extensibility, and maintainability. The content is linked to underlying concepts such as agile development or design principles like SOLID.     
**Assessment:** Coursework (40%), Coursework (60%)  
\*All transcripts are issued in UK credits.

### Customer Relationship and Change Management (CRM & CM) with Business Intelligence

[**Module Code: 6BUIS017W**](#6BUIS017W_return)

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

This module examines customer relationship management and change management as important current business strategies empowered by business intelligence to solve problems in analytic customer relationship management and support business process change and change management.  
**Assessment:** Coursework (50%), Coursework (50%)  
\*All transcripts are issued in UK credits.

### Strategic Management of Information Systems

[**Module Code: 6BUIS019W**](#6BUIS019W_return)

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

Information Systems (IS) or Information Technology (IT) in general are now regarded as a key strategic resource by many. Indeed, IS can be so critical as to disrupt classic business models, threatening traditional revenue streams and even driving industry sectors to extinction. The module aims to offer students an opportunity to explore how organisations (small to large) exploit and use IS strategically in order to enhance organisational performance. The students will utilise strategic tools and frameworks for strategic planning and for developing an IS/IT strategy and will learn fundamentals concepts in relation to IS management. The module aims to develop students’ abilities to make an effective contribution at a strategic level in the field of the management of IS.  
**Assessment:** Examination - closed book (50%), Coursework Group (50%)  
\*All transcripts are issued in UK credits.

### Applied AI

[**Module Code: 6COSC020W**](#6COSC020W_return)

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

The module will provide students with an understanding of the foundations of Artificial Intelligence and principal sub-fields of AI that have made significant impact, including but not limited to: Planning, Multi Agent Systems, Fuzzy Logic, Neural Networks, Evolutionary Computation, Computer Vision, Reinforcement Learning, Natural Language Processing, and Deep Learning. Each week an essential technique will be demonstrated via a complete implementation followed by a presentation of the theory and conditions needed to enable the student to set up and use the techniques themselves.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Usability Testing and Evaluation

[**Module Code: 6MMCS009W**](#6MMCS009W_return)

**Level 6**

**Semester 1**

**UK Credit Value: 20**

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

The module provides students with essential skills and practice in a range of usability techniques, how to conduct usability studies and evaluations of a wide range of products or platforms. The importance of applied understanding of the different evaluation approaches and the use of experimental design and statistical analysis is illustrated through real world examples. The ability to interpret and critically discuss results is stressed throughout.  
**Assessment:** Coursework Group (50%), Coursework (50%)  
\*All transcripts are issued in UK credits.

### Formal Methods

[**Module Code: 6SENG005W**](#6SENG005W_return)

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: sufficient academic background to enter final year of ComSci or SoftEng degree.***  
The module examines the use of formal methods in system specification and program development. A formal specification language will be covered in depth, with use of suitable case studies. The following areas will be covered: the mathematical notation of the specification language, the design of structured specifications, the use of tools to support specification development and the rigorous reasoning about specifications and programs. Additionally, students will be introduced to the framework of formal reasoning about program specification widely known in software industry as software verification.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.

### Concurrent Programming

[**Module Code: 6SENG006W**](#6SENG006W_return)

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: sufficient academic background to enter final year of ComSci or SoftEng degree.***  
The module introduces the concurrent programming paradigm using a practical approach to provide the student with the skills and knowledge to be able to analyse, design and develop concurrent programs.  Practical experience of concurrent programming is provided via the concurrency features of Java.  The areas covered are: concurrency concepts; details of a concurrent programming language; a survey of classic concurrency problems; concurrent program design and analysis using FSP and Labelled Transition Systems.  
**Assessment:** Coursework (50%), In-Class Test/Assignment exam conditions (50%)  
\*All transcripts are issued in UK credits.