## Module CatalogueComputer Science and EngineeringUndergraduate Exchange 2025/6Semester 1

| **Module Code** | **Module Name** | **Level** | **Semester** | **UK Credit Value** |
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| **Computer Science and Engineering** |
| 4CCGD005W | [Introduction to Game Design](#4CCGD005W) | 4 | Semester 1 | 20 |
| 5BUIS017W | [BIS Design and Architecture](#5BUIS017W) | 5 | Semester 1 | 20 |
| 5BUIS020W | [Information Technology Security](#5BUIS020W) | 5 | Semester 1 | 20 |
| 5CCGD011W | [Game Engine Architecture](#5CCGD011W) | 5 | Semester 1 | 20 |
| 5CCGD012W | [Game Programming Patterns](#5CCGD012W) | 5 | Semester 1 | 20 |
| 5COSC019W | [Object Oriented Programming](#5COSC019W) | 5 | Semester 1 | 20 |
| 5COSC020W | [Database Systems](#5COSC020W) | 5 | Semester 1 | 20 |
| 5COSC026W | [Advanced Client-Side Development](#5COSC026W) | 5 | Semester 1 | 20 |
| 5DATA005W | [Data Engineering](#5DATA005W) | 5 | Semester 1 | 20 |
| 5DATA006W | [Data Visualisation and Communication](#5DATA006W) | 5 | Semester 1 | 20 |
| 5MMCS007W | [3D Interactive Media Development](#5MMCS007W) | 5 | Semester 1 | 20 |
| 5SENG007W | [Software Engineering Principles and Practice](#5SENG007W) | 5 | Semester 1 | 20 |
| 6BUIS017W | [Customer Relationship and Change Management (CRM & CM) with Business Intelligence](#6BUIS017W) | 6 | Semester 1 | 20 |
| 6BUIS019W | [Strategic Management of Information Systems](#6BUIS019W) | 6 | Semester 1 | 20 |
| 6COSC020W | [Applied AI](#6COSC020W) | 6 | Semester 1 | 20 |
| 6MMCS009W | [Usability Testing and Evaluation](#6MMCS009W) | 6 | Semester 1 | 20 |
| 6SENG005W | [Formal Methods](#6SENG005W) | 6 | Semester 1 | 20 |
| 6SENG006W | [Concurrent Programming](#6SENG006W) | 6 | Semester 1 | 20 |

## Computer Science and Engineering

### Introduction to Game Design

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

**Level 4**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### BIS Design and Architecture

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### Information Technology Security

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### Game Engine Architecture

[**Module Code: 5CCGD011W**](#5CCGD011W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***Exchange applicants - for students from Westminster International University of Tashkent only.***
This module introduces students to modern game engine architecture and technologies. The conceptual architecture framework and the subsystem integration including the low-level foundation systems, the rendering engine, game asset management, the physics simulation, event-based gameplay system will be critically accessed. Students will gain the theory underlying the various subsystems that comprise a commercial game engine and the data structures and essential algorithms and develop practical skills that are typically used to implement a 3D game prototype using industry game engines.
**Assessment:** In-Class Test/Assignment exam conditions (30%), Coursework (70%)

### Game Programming Patterns

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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%)

### Object Oriented Programming

[**Module Code: 5COSC019W**](#5COSC019W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***Exchange applicants - for students from Westminster International University of Tashkent only.***
***Pre-requisite: Attended and passed 2 modules of programming (any language).***
This module will teach the fundamental ideas behind the object-oriented approach to programming. It will provide students with knowledge and practical experience in writing computer programmes using object-oriented programming techniques. It will cover in a practical way the design and implementation of object-oriented software for software applications through the entire software development lifecycle.
**Assessment:** Lab-Based Practical (50%), Examination - closed book (50%)

### Database Systems

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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 - closed book (60%)

### Advanced Client-Side Development

[**Module Code: 5COSC026W**](#5COSC026W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***Exchange applicants - for students from Westminster International University of Tashkent only.***
This module provides practical knowledge and understanding of client-side or/else front-end development programming using advanced HTML5, CSS3 and JavaScript. Client-side technologies, including HTML5 Audio and Video are covered together with a client-side scripting language, a UI and CSS framework and a client-side scripting framework. The module also covers issues pertaining to front-end security.
**Assessment:** In-Class Test/Assignment exam conditions (40%), Coursework (60%)

### Data Engineering

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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%)

### Data Visualisation and Communication

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### 3D Interactive Media Development

[**Module Code: 5MMCS007W**](#5MMCS007W_return)

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***Exchange applicants - for students from Westminster International University of Tashkent only.***
This module introduces students to concepts of 3D user interfaces for interactive media. It covers essential topics including 3D modelling principles, methods and techniques, complex object creation, deformation and transformations, texture mapping, colour and lighting. It uses an industry standard games engine to demonstrate 3D animation concepts, properties, controllers and scripting to create interactive media content. This is part of the “Usability and Interaction” and “Games and Computer Graphics Development“ themes for Computer Science, but is open to all courses with no pre-requisite. Supported coursework path is the production of an interactive rich media product.
**Assessment:** Coursework Group (50%), Coursework Group (50%)

### Software Engineering Principles and Practice

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

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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%)

### 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**

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%)

### Strategic Management of Information Systems

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

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### Applied AI

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

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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%)

### Usability Testing and Evaluation

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

**Level 6**

**Semester 1**

**UK Credit Value: 20**

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%)

### Formal Methods

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

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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%)

### Concurrent Programming

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

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

***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%)