

# Module Catalogue

## Computer Science

### Undergraduate Exchange 2019/0

#### Semester 1

Module Code	Module Name	Level	Semester	UK Credit Value	Credit Equivalency
<b>Computer Science and Engineering</b>					
4COSC001W	Programming Principles I	4	Semester 1	20	US Credits 4 / ECTS credits 10*
5BUIS003W	Information Technology Security	5	Semester 1	20	US Credits 4 / ECTS credits 10*
5COSC001W	Object Oriented Programming	5	Semester 1	20	US Credits 4 / ECTS credits 10*
5COSC002W	Database Systems	5	Semester 1	20	US Credits 4 / ECTS credits 10*
5COSC015W	Advanced Client-side Development	5	Semester 1	20	US Credits 4 / ECTS credits 10*
6CCGD001W	Game Development Group Project III	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6COSC001W	Enterprise Application Development	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6COSC005W	Advanced Server-Side Web Programming	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6MMCS001W	Mobile User Experience	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6MMCS004W	Advanced Interactive Media Development	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6SENG001W	Reasoning about Programs	6	Semester 1	20	US Credits 4 / ECTS credits 10*
6SENG002W	Concurrent Programming	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.

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# Computer Science and Engineering

## Programming Principles I

**Module Code: 4COSC001W**

**Level 4**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

An introduction to Computer Programming with a strongly-typed language. The module concentrates on teaching the fundamentals of programming using a requirements-centred approach to algorithm design. Basic coding structures such as sequence, selection, and iteration will be covered. There will be an emphasis on practical exercises to develop programming experience and confidence.

**Assessment:** Practical Work (50%), In-Class Test/Assignment exam conditions (50%)

\*All transcripts are issued in UK credits.

## Information Technology Security

**Module Code: 5BUIS003W**

**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:** Group Coursework (50%), Examination - closed book (50%)

\*All transcripts are issued in UK credits.

## Object Oriented Programming

**Module Code: 5COSC001W**

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: Programming experience required***

This module covers in a practical way the design and implementation of object-oriented software for typical software applications through the entire software lifecycle.

**Assessment:** Coursework (50%), Examination - closed book (50%)

\*All transcripts are issued in UK credits.

## Database Systems

**Module Code: 5COSC002W**

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

**Pre-requisite: 4COSC003W Computer Science Practice**

The module builds on the concepts of database design and data manipulation via SQL that were introduced in Computer Science Practice. In addition, it introduces UML notations, and Normalisation as a method for checking table structures. Application programming with embedded SQL and Data Security are also addressed.

**Assessment:** Coursework (70%), Examination - closed book (30%)

\*All transcripts are issued in UK credits.

## Advanced Client-side Development

**Module Code: 5COSC015W**

**Level 5**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

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%)

\*All transcripts are issued in UK credits.

## Game Development Group Project III

**Module Code: 6CCGD001W**

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

**Pre-requisite: C++ Programming experience required**

This module provides students 3D game development experience of group working using an industry standard shader based programming API with emphasis on in-depth understanding of advanced 3D graphics algorithms and object oriented software design principles. Students participate in a team work based on an incremental and iterative game development production process to manage the full life-cycle of a computer games project underpinned by an entrepreneurial approach with the awareness of professional practices.

**Assessment:** Group Coursework (40%), Group Practical (60%)

\*All transcripts are issued in UK credits.

## Enterprise Application Development

**Module Code: 6COSC001W**

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: 5COSC001W Object Oriented Programming or equivalent***

This module builds on the skills developed in 5COSC001W, 5COSC003W and 5COSC004W, by extending OOD and analysis techniques with frameworks for Enterprise Application Development (EAD). Enterprise features of contemporary frameworks are identified and then used to develop applications. Methodologies for EAD are also explored. Throughout a focus is maintained on the layers of an Enterprise Application and the choice of an appropriate technology for each layer. By the end the student should be able to apply and reflect on the advantages and disadvantages of the variety of patterns, and methodologies used for EAD.

**Assessment:** Coursework (50%), Coursework (50%)

\*All transcripts are issued in UK credits.

## Advanced Server-Side Web Programming

**Module Code: 6COSC005W**

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: 5COSC006W Server-side Web Development or equivalent***

The module covers the techniques and technologies involved in building large-scale advanced web applications. It is suitable for students with a background in web design and web development, with knowledge of web scripting and SQL.

**Assessment:** Coursework (40%), Coursework (60%)

\*All transcripts are issued in UK credits.

## Mobile User Experience

**Module Code: 6MMCS001W**

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

***Pre-requisite: 4MMCS003W Web Design & Development and 4COSC001W Programming Principles I or equiv***

This module is designed to give students an exposure to the complete design process of mobile interfaces, from concept creation to product testing. It exposes the students to user experience (UX) issues related to designing for multiple mobile platforms, devices and interaction styles. The module uses an industry-standard framework to demonstrate the aforementioned topics by implementing a mobile web app with responsive content and game like elements. It also covers augmented reality for mobiles using canvas and WebGL.

**Assessment:** In-Class Test/Assignment exam conditions (40%), Group Coursework (60%)

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## Advanced Interactive Media Development

**Module Code: 6MMCS004W**

**Level 6**

**Semester 1**

**Location: Cavendish**

**UK Credit Value: 20**

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

This module covers essential topics of advanced animation production (motion capture pipeline, data processing,

animation blending, and incorporation of the animation in an industry standard games engine). It also provides an understanding of the issues, technologies and concepts underlying the vision of pervasive computing infrastructure to create alternative interaction styles. Specifically, concepts and basic techniques of 3D capture, analysis and representation using commercial consumer depth camera (currently Kinect).

**Assessment:** Coursework (40%), Coursework (60%)

\*All transcripts are issued in UK credits.

## Reasoning about Programs

**Module Code:** 6SENG001W

**Level 6**

**Semester 1**

**Location:** Cavendish

**UK Credit Value:** 20

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

**Pre-requisite:** 5SENG001W *Algorithms: Theory Design and Implementation or equivalent*

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 (40%), Examination - closed book (60%)

\*All transcripts are issued in UK credits.

## Concurrent Programming

**Module Code:** 6SENG002W

**Level 6**

**Semester 1**

**Location:** Cavendish

**UK Credit Value:** 20

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

**Pre-requisite:** 5COSC001W *Object Oriented Programming or equivalent*

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 (40%), Examination - closed book (60%)

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