LONDON SCHOOL OF COMMERCE

Programme Specification for the

Cardiff Metropolitan University

BSc (Hons) in Computing

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LONDON SCHOOL OF COMMERCE

BSc (Hons) in Computing

Aims and Objectives

The programme which is at academic level 6 (UK Honours Degree), is designed for those students who hold the equivalent of UK AS/A2 High School learning qualifications, who wish to study a computing-related programme. The programme includes topics, which give students an understanding of computing processes and introduce them to information technology.

The principal aim of the programme is therefore to produce students with the knowledge, skills and potential to embark on careers involving computer applications in the international environment.

More generally, the programme aims to:

- develop the lifelong learning skills and continuing personal development of all students,
- develop and support students` independent learning and ability to undertake independent investigations in the field of computing applying up to date theories and techniques,
- provide students with opportunities to improve their communication skills,
- provide students with the opportunity to gain accreditation towards professional body qualifications,
- prepare students for a career in technology and computing through the development of an understanding of the complex core body of knowledge of the Computing subject area.

Objectives:

The above aims will be met by students developing their:

- understanding of how they learn and ability to formulate new ideas;
- knowledge of, and ability to use, appropriate information systems;
- skills in numeracy to enable them to understand and use appropriate programming and analysis;
- ability to undertake investigations and to analyse the data and information gathered;
- written and oral communication skills.

Programme Structure

The Diploma programme comprises four fourteen week semesters. In each semester, students study three modules, each of which is equivalent to 20 credit points, apart from 40-credit project in semester 6.

Semester 1

1. Maths for Computing and Introduction to Programming
2. Object Modelling Techniques
3. Database Systems Management

Semester 2

4. E-Commerce and Web Design
5. Object Oriented Programming
6. Multimedia and Graphics

Semester 3

7. Operating Systems
8. Networking and Data Communications
9. Human Computer Interaction

Semester 4

10. Mark-up Language Applications
11. Client Server Architecture
12. Software Engineering

Semester 5

13. Academic Research and Development
14. Management Information Systems
15. Software Project Management

Semester 6

16. Project

Electives (any one of the following):

17. Advanced Software Engineering
18. Contemporary Issues in Designing Information Systems

Programme Outcomes:

A Knowledge and Understanding

On completion of this programme the successful student will be able to:

A1 demonstrate an understanding of the basic concepts of software development and maintenance, such as the identification of users' needs, the principles of programming, and the representation and meaning of data

A2 the methods and tools used to develop a range of software systems

A3 the range of situations in which computer systems are used, the ways in which people interact with them, and the ethical, social and legal issues that computer software generates

A4 working with an employer to plan career development.

B Cognitive Skills

On completion of this programme the successful student will be able to:

B1 explain basic software development concepts and apply them to practical problems in a working environment

B2 analyse problems, and design and evaluate suitable solutions to them

B3 explain the various roles, functions and interactions of members of a software development team

B4 reflect on what is achieved in a piece of work, and how it might improve one's performance.

C Practical/Professional Skills

On completion of this programme the successful student will be able to:

C1 design, programme, test and evaluate software systems

C2 use modern software tools, both within and outside the workplace

C3 identify and handle the ethical and legal issues that may arise during software development and use

C4 follow a career development path towards professional certification

C5 work with an employer to agree, record and review career development plans.

D Transferable Skills

On completion of this programme the successful student will be able to:

D1 work independently, planning, monitoring, reflecting on and improving one's own learning and working practices

D2 work in a group, communicating computing ideas effectively

D3 find, assess and apply information from a variety of sources, using information technology where necessary

D4 use numerical and analytical techniques confidently to solve realistic problems.

Level 4 – Certificate in Computing

	Course Outcomes	Maths for Computing and Introduction to Programming	Object Modelling Techniques	Database Systems Management	E-Commerce and Web Design	Object Oriented Programming	Multimedia and Graphics
Knowledge and understanding	A1	**X**	**X**		**X**	**X**	**X**
	A2	**X**	**X**	**X**	**X**	**X**	**X**
	A3				**X**		
	A4						
Cognitive Skills	B1		**X**	**X**	**X**	**X**	**X**
	B2	**X**	**X**	**X**	**X**	**X**	**X**
	B3						
	B4						
Practical / Professional Skills	C1			**X**	**X**	**X**	**X**
	C2		**X**		**X**	**X**	**X**
	C3						
	C4				**X**		
	C5						
Transferable Skills	D1						
	D2						
	D3						
	D4						

Level 5 – Diploma in Computing

	Course Outcomes	Operating Systems	Networking and Data Communications	Human Computer Interaction	Mark-up Language Applications and Web Programming	Client Server Architecture	Software Engineering
Knowledge and understanding	A1			**X**	**X**		**X**
	A2		**X**	**X**	**X**	**X**	**X**
	A3	**X**		**X**			**X**
	A4						**X**
Cognitive Skills	B1	**X**	**X**	**X**		**X**	**X**
	B2			**X**			**X**
	B3						**X**
	B4			**X**			**X**
Practical / Professional Skills	C1	**X**		**X**	**X**	**X**	**X**
	C2				**X**		**X**
	C3			**X**			**X**
	C4		**X**		**X**		
	C5						**X**
Transferable Skills	D1			**X**			**X**
	D2			**X**			**X**
	D3						
	D4			**X**			**X**

Level 6 – BSc in Computing

	Course Outcomes	Academic Research and Development	Management Information Systems	Software Project Management	Advanced Software Engineering	Contemporary Issues in Designing Information Systems	Project
Knowledge and understanding	A1	**X**					**X**
	A2			**X**	**X**		**X**
	A3	**X**	**X**	**X**		**X**	**X**
	A4		**X**			**X**	
Cognitive Skills	B1		**X**	**X**	**X**	**X**	**X**
	B2	**X**	**X**	**X**		**X**	**X**
	B3		**X**	**X**		**X**	
	B4	**X**		**X**			**X**
Practical / Professional Skills	C1	**X**		**X**	**X**		**X**
	C2			**X**	**X**		**X**
	C3		**X**	**X**		**X**	**X**
	C4				**X**		
	C5		**X**			**X**	
Transferable Skills	D1	**X**		**X**			**X**
	D2		**X**	**X**			
	D3	**X**	**X**	**X**			**X**
	D4						

Teaching, Learning and Assessment

Teaching and learning methods

Delivery of the curricular material will be through a blend of various teaching methods, They can comprise lectures, tutorials, seminars and workshops.

Learning Strategies

Students are expected to take greater responsibility for their own learning as they progress through their courses. The course structure and the proposed teaching strategies are designed to encourage this development. The student-centred approach will be encouraged through the use of specific teaching strategies; case studies; projects; practical exercises, supplemented by the use of appropriate support materials; videos; computer software; etc. Active engagement with the subject material enhances learning and many of the learning strategies used attempt to promote this.

In self-directed learning (SDL), the individual takes the initiative and the responsibility for what occurs. Individuals select, manage, and assess their own learning activities, which can be pursued at any time, in any place, through any means, at any age..

In essence, self-directed learning is seen as any study form in which individuals have primary responsibility for planning, implementing, and even evaluating the effort.

The process also involves “personal challenge” activities and developing the personal qualities to pursue them successfully. All modules within the programme have elements of self-directed learning within their teaching strategies. This will involve students in undertaking practical activities such as case studies, lab sessions, etc.

Assessment

Assessment of knowledge and understanding is achieved using written examinations (seen/unseen, open book, essays/short answers), essays, practical assessment, presentations and dissertations/project reports.

Assessment of cognitive skills is integrated throughout all modules.

Students are encouraged to use a wide range of quality information sources as the evidence base for assessments and in-class activities. Use of higher order skills of critique, analysis, evaluation and synthesis are a requirement of module assessment outcomes.

Module Title
Maths for Computing and Introduction to Programming

Aim(s)
This course provides students with knowledge of mathematics as it relates to information science. The course introduces various discrete mathematics topics including set theory, logic, combinatorics, probability and graph theory introducing algorithms, and various mathematical proof techniques including mathematical induction. This course reveals the relationship between mathematics and computing. Issues related to logic and analysis are discussed. The module also teaches how to use logic of programming and applying it to the logic of mathematics. Concepts such as flowcharts, decision making, programming logic and constructions will provide the basis for designing programs.

Module Title
Object Modelling Techniques

Aim(s)
This course aims to introduce the students in theory and practice to computer system development using the concepts of objects and indicate the need for object-oriented techniques as well as its principles. This course will give students an understanding of the most common tools, techniques, and theories currently used in object-oriented systems analysis and also teach them why object modelling and object-oriented requirements specification are very important. The students will use Rational Rose tool for system modelling.

Module Title
Database Systems Management

Aim(s)
This module is intended to be a student's first in-depth study of database design and implementation. It will be useful, though not essential, for students to have had prior exposure to information technology, and to be able to use software like Microsoft Office and also to have had an introduction to tabular manipulation of data using a spreadsheet system like Excel and/or a database system like Access. The module aims to equip students with a full range of skills required in the design and implementation of database systems by leading them through all aspects of the database life cycle.

Module Title

E-Commerce and Web Design

Aim(s)

This module gives students the experience of creating a web site of their own. It has a practical focus to enable them to transform themselves from the position of a consumer to a creator of rich Internet media. The Internet is ubiquitous in business and domestic environments especially with the advent of handheld electronic devices.

This module gives students an understanding of creating a web site from the view point of a designer and gives practical knowledge to create sites that can be extended into real businesses. The module is designed for students who will have used the Internet, but have little experience or knowledge of web design. Learning is from the ground up, with the major aim of providing students with the essential skills and knowledge to equip them to become active professionals in a dynamic rapidly developing technology.

Students are introduced to the design process and equipped to recognize the principles of good web site design. Web site composition is analysed in sections with students receiving detail and experience, equipping them to make informed choices about how to code and build their own web site.

The course will enable students to understand the position of a web designer, know the tools and methods to create a web site, and know the thought processes and choices that go into making a well crafted web site. A portion of the module includes hands on practical experience and tuition in the use of content creation tools for building web sites.

Module Title
Object Oriented Programming

Aim(s)
This module is designed to give students an introduction to Object Oriented Programming, mainly using Java and C++. Object Oriented Programming is the most important and dominant programming approach today. Engineers have historically used Fortran, but Java and C++ are the dominant languages today. Object Oriented Programming is quite different from functional or procedural programming, and it is difficult to learn. In this module OOP through Java, C++, C# and UML will be used. The goal is for the students to develop an understanding of objects, how they work and their use in a well-designed interface. How to interface Java with native applications (JNI), how to program over a network using the client/server model (e.g. CORBA and Java Remote Method Invocation), and how to connect to relational databases using JDBC (Java Database Connectivity) will also be taught.

Module Title
Multimedia & Graphics

Aim(s)
This module gives students contact with different forms of digital media, and has a practical focus to enrich them with comprehensive multimedia manipulation skills. Digital media and its primary sub-component, graphics, are becoming an increasingly important part of business, industry, entertainment, and education. The use of multimedia is ubiquitous in business and domestic environments especially with the advent of handheld electronic devices. This module gives students an overview of today's multimedia and graphics world and enables them to gain enough practical knowledge to begin creating productions for desktop and Internet use. The course includes multimedia development, multimedia data types (text, graphics, audio and video), and exposure to tools used in the multimedia industry. Students are introduced to the different types of multimedia and equipped to categorize any new examples they may come across. The composition of the individual media types is studied, giving students a good grounding in the principles of each media type and equipping them to make informed choices about how to use such media types in their own productions. The course will enable students to identify features of several multimedia authoring software packages as well as understand how multimedia titles are developed. A significant portion of the module includes hands on practical experience and tuition in the use of industry multimedia tools, most notably Photoshop.

Module Title
Operating Systems

Aim(s)
This subject provides both an overview of the functions and administration of operating systems and specific skills in using operating systems such as UNIX to an advanced level. The UNIX operating system has been chosen as the base system for the subject content since it provides a rich suite of utilities and a stable and a relatively standard platform on which to learn. Since most web servers worldwide are hosted on UNIX-like systems, this module is highly relevant to students studying any module concerned with E-commerce. The module also introduces the C programming language, which is related to UNIX, shell scripting techniques and system administration duties. The subject 'Server-Side Web Programming' (also available in this academic course) is a good subject to undertake either in conjunction with this one or in sequence with it. Students are exposed to the look and feel of UNIX from a simple user's point of view and progress into explorations of the file system, many standard UNIX utilities and finish the subject with some exposure to the C programming language (native to UNIX), shell scripting techniques and system administration duties.

Module Title
Networking and Data Communications

Aim(s)
The area of computer networks is exhibiting an extremely rapid growth, which has been influenced by both technology and application domains. This course introduces the theoretical and practical considerations that go into creating a computer network. The course is intended to give the students a broad and up-to-date knowledge in the area of computer networks. It covers the basic concepts involved in the electronic transmission of business data from one computer system to another and the major types of network topologies and protocols. The course also serves as a general introduction for students who need a foundation in current networking technology for local area networks (LANs), wide area networks (WANs), and the Internet. Topics are selected to reflect current trends and interests.

Module Title
Human Computer Interaction

Aim(s)
This subject emphasises the importance of good design of the interface between humans and computers. Factors that influence what happens at this interface are presented; design principles are provided and discussed, and strategies for evaluation are reviewed.

Module Title
Mark-up Language Applications

Aim(s)
This subject provides students with an exposure to markup languages in general and XML in particular. Markup languages and the meta languages like SGML and XML which create and define them have become a very popular and extremely useful technology for storing data in document form so that the data can be leveraged in multiple ways across multiple computing platforms and for the delivery of data between remote applications independently of the software and hardware used at those applications. Students are introduced to the aims of markup from a very general perspective, dealing with some historical markup schemes and in HTML. They then learn the overall principles of 'good' markup and document/data structure and an appreciation of sound design decisions with respect to document and data storage, validation and processing. The subject includes content dealing with simple document analysis, well-formed and valid markup creation, modest document type definitions and ultimately the processing of XML data for transformation purposes. Some of the work covered in this subject requires the use of the Java programming language. This language has been chosen because it provides an elegant and powerful mechanism for processing XML using SAX. Exposure to XML processing using Java programming language allows students to actually see the results and benefits of markup languages. This helps to make the subject more interesting and applicable to real applications.

Module Title
Client Server Architecture

Aim(s)
The dynamic nature of business environment is changing the way computer resources are being used in an organisation to enhance interaction among employees and reducing costs. The Client/Server computing model is an example of co-operative distributed processing where both hardware and software are shared among users. This module is intended to introduce the students to the basic concepts necessary to design and implement a client/server system and discusses underlying technologies (networks, databases, applications) and management approaches (planning, staffing, organizing). Different client server architectures will be presented with emphasis on the way in which Web technology and the Intranet can be used to implement client -server systems. This module will also provide students with a working knowledge of the capabilities and limitations of the technologies underlying networked computing.

Module Title
Software Engineering

Aim(s)
The module has been designed to provide the skills and knowledge necessary for systems modelling, design and analysis. It also aims to provide an in-depth understanding of basic principles of formal specifications of system requirements, and the skills and knowledge necessary to develop object-oriented specifications of computer-based systems. The module also aims to teach basic principles of (object-oriented) program specifications and their role in program verification. It illustrates how they relate to formal specifications of system requirements. It also provides skills and knowledge necessary to develop specifications of Java programs

Module Title
Academic Research and Development

Aim(s)
This module introduces students to the range of knowledge and skills required to do competent, independent research work that constitutes a contribution to knowledge. The course includes research design, data collection and data analysis, statistical analysis of data; use of computer in data generation and analysis. The module also provides the student with a comprehensive knowledge of good research and professional practices, as well as ethical and legal issues relating to the study, implementation, application, evaluation and presentation of a project in the Computing discipline.

Module Title
Management Information Systems

Aim(s)
To promote an understanding of the role of IT in the strategic planning of an enterprise To promote an understanding of the interaction of IT with the structure and culture of an enterprise To promote an understanding of the need for, and the techniques of, introducing change and innovation into an organisation, especially the introduction or expansion of IT

Module Title
Software Project Management

Aim(s)
In this course student apply what they have learned in previous IT subjects to a small commercial IT project. The project involves working with a group of two to three students. Students will apply and develop the skills and knowledge they have acquired in system analysis and design, database management, project management and programming to this project. Students are expected to demonstrate and develop their communication, teamwork and IT skills as part of this project.

Module Title
Project

Aim(s)
This double unit has been designed to enable the student to apply academic and technical skills and techniques acquired throughout their undergraduate studies. It also provides the student with the opportunity to pursue individual study in depth in a subject relevant to the student's chosen pathway. Students should produce one or more pieces of software, the analysis and design of which will normally require research into current academic theory. However, projects which do not physically produce software but do use substantial pieces of software may under certain circumstances be allowed if they address current professional issues.

Module Title
Contemporary Issues in Designing Information Systems

Aim(s)
This research-underpinned module is designed to advance students' comprehension of the role of information in society, especially in light of exciting contemporary developments in information, media and communication technologies. The aim is to enable the student to engage in informed, active participation in the cutting-edge debates (ethical, political, sociological and professional) surrounding the rise of globally networked post-industrial societies, or what are sometimes called Information Societies. In practical terms, the module helps to prepare the student for intelligent, successful, graduate-level functioning in a rapidly changing, technologically-driven economy, work-force and culture. The module would suit anyone with an interest in social, ethical or professional issues relating to the Internet and the information society.

Module Title
Advanced Software Engineering

Aim(s)
The module takes a rigorous approach to software development, building up on the level two module on software engineering. It examines the use of formal methods for the specification, development and verification of software. It presents a range of techniques for the analysis and implementation of real-time solutions. The student will investigate the theory and problems of concurrent systems.