UNIT INFORMATION

CO1102   MATHEMATICS FOR COMPUTING
Number systems; sets and subsets; set algebra; symbolic logic and logic gates; sequences; summations; elementary counting principles; probability; relations and functions; matrix algebra; systems of linear equations; introduction to the theory of graphs and digraphs.
Assessment: One three-hour unseen written paper.

CO1109   INTRODUCTION TO JAVA AND OBJECT-ORIENTED PROGRAMMING
Basic Types and Expressions; Assignment Statements; Loops and Conditionals (Simple and Nested); Handling Simple I/O; Objects and Classes; Methods with and without parameters; Inheritance; Constructor Methods (and the use of 'new'); Method Overloading; Method Overriding; Arrays and simple sorting; Basic File Handling; Try and Catch (Simple Exception Handling); Implementing Simple Graphical User Interfaces; Incorporating Applets in a Web page; Simple built-in Dynamic Structures — Vectors; Types vs. Classes; Scope of Variables; Code Layout and Documentation.
Assessment: One three-hour unseen written paper and coursework.

CO1110   INTRODUCTION TO COMPUTING AND THE INTERNET
Basic computing and communication skills. Fundamentals of computing – hardware, software, architecture, operating systems. Data storage, representation and transmission. Fundamentals of networking and the Internet/www: technology, protocols, standards and applications. Professional, legal and social issues relating to the Internet and www.
Assessment: One three-hour unseen written paper and coursework.

CO1112   CREATIVE COMPUTING 1: IMAGE, SOUND, MOTION
The Bauhaus; History of mathematics and computing in creativity; Multimedia; Point, Line, Plane; Trigonometry 1; Animation 1; Bits and Pixels; Motion 2; Perspective, Projections and Affine Transformations; Open GL; Genetic programming; Simulation; Filters and Special Effects.
Assessment: One three-hour unseen written paper and coursework.

CO2209   DATABASE SYSTEMS
Introduction to Database Systems, Database modelling (basic concepts, E-R modelling, Schema deviation). The relational model and algebra, SQL (definitions, manipulations, access centre, embedding). Physical design (estimation of workload and access time, logical I/Os, distribution). Modern database systems (extended relational, object-oriented). Advanced database systems (active, deductive, parallel, distributed, federated). DB functionality and services (files, structures and access methods, transactions and concurrency control, reliability, query processing).
Assessment: One three-hour unseen written paper and coursework.

CO2220   GRAPHICAL OBJECT-ORIENTED AND INTERNET PROGRAMMING IN JAVA
This unit will give students an insight into the object-oriented approach to the design and implementation of software systems. The unit also considers specific features of the programming language Java, in particular, graphical interfaces and event driven applications. The second part of the unit is intended to give students the necessary background to understand the technical software aspects of how computers communicate across the internet. Students will be introduced to the underlying principles of client-server computing systems and will gain the required conceptual understanding, knowledge and skills to enable them to produce simple web-based computing systems in Java.
Assessment: One three-hour unseen written paper and coursework.

CO2226   SOFTWARE ENGINEERING, ALGORITHM DESIGN AND ANALYSIS
Software design in UML: use cases, class modelling, objects and links, aggregations and dependencies, activity diagrams, statecharts; Principles of good software design, software development lifecycle, the role of design and modelling in software development; Software verification and validation; Project management and planning; Case studies and software horror stories. Abstract data types, design patterns, algorithmic issues, complexity theory, the application and implementation of common data structures in Java.
Assessment: One three-hour unseen written paper and coursework.

CO2227   CREATIVE COMPUTING 2: INTERACTIVE MULTIMEDIA

Signals and systems; perception; audio and image signal processing (including convolution, filters, the Fast Fourier Transform); image techniques (such as texture mapping, transparency, blending); advanced computer graphics for scene description and rendering; animation (techniques and concepts); user interface issues (such as advanced mouse control, keyboard control, text input / output); creative development; visual literacy; multimedia manipulation; action scripting.
Assessment: One three-hour unseen written paper and coursework.

CO3310   ARTIFICIAL INTELLIGENCE

Knowledge representation, propositional and predicate calculus; problem solving: state-space search; breadth-first and depth-first search; planning; natural language; expert systems; philosophy of AI.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3311   NEURAL NETWORKS

The artificial neuron; network architecture; perceptrons. Single layer networks; supervised training in batch and individual mode. Multilayer feedforward networks; backpropagation; momentum. Counterpropagation networks; unsupervised training; initialisation of weights. Statistical methods; Boltzmann training. Feedback networks; Hopfields nets; energy; training. Applications.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3318   INFORMATION SYSTEMS MANAGEMENT

An introduction to the various facets of Information Systems Management. Topics include: the importance of close integration between business and IS planning, information security and safety critical systems; data protection legislation; Computer Misuse Act and other relevant legislation. Ethical and professional issues. Strategic planning of IS; evaluation of IS investments.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3323   ELECTRONIC COMMERCE

To familiarise students with current and emerging electronic commerce, technologies using the internet. Subject areas will include 'Internet Technology for Business Advantage', 'Web-based Tools for Electronic Commerce', 'Electronic Payment Systems', 'Strategies for Marketing', 'Sales and Promotion', 'Internet Security', 'International, Legal, Ethical and Tax Issues'.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3326   COMPUTER SECURITY

Passwords; access controls; symmetric and asymmetric encryption; confidentiality; authentication; integrity; nonrepudiation; availability; hash functions. Security for electronic mail, IP, Web, databases, distributed systems. Standards.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3346   SOUND AND MUSIC

Sound synthesis and manipulation; computer systems and models in music; multimedia and music information retrieval; computer music creativity (machine-led, human-led and machine/human interaction).
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3348   INTERACTION DESIGN

This course examines the notion of 'interaction with technology' with a focus on the design concepts of modern user experience design and production. It begins with a grounding in the specification, design, prototyping and evaluation of advanced interactive systems, with an introduction to HCI and a short history of the field. An overview of design approaches follows. Human/user attributes and requirements, and interaction paradigms, looks at the human in HCI and available types of interaction. Usability requirements/usability engineering are discussed in the context of a number of specific design approaches and techniques, requirements and issues. Design guidelines and standards, accessibility requirements, and issues involved in designing for specific populations (globalisation and internationalism) follows. Finally, information on current interaction design questions and approaches for new and emerging technologies and paradigms provides an exposition of real-world applications and sectors where Interaction Design is relevant.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3353   SOFTWARE ENGINEERING PROJECT MANAGEMENT

Pre-requisite: Software engineering, algorithm design and analysis CO2226.

The course examines software process and engineering concepts such as the software lifecycle, object oriented programming, design for re-use and user-centred design, together with contemporary approaches such as Agile methods of software and project management (for which a grounding in traditional development methodologies is necessary). It focuses on selection of tools and methodologies for specific purposes, and explores a variety of contexts, ranging from embedded systems, to the inherently parallel distributed environments of cloud computing to the multidisciplinary design of advanced interactive and web-based technologies.
Assessment: One 2 ¼-hour unseen written paper and coursework.

CO3355   ADVANCED GRAPHICS AND ANIMATION

This course will cover major contemporary graphics and animation techniques. Students will be given the mathematical foundations of the subject as well as other theoretical foundations such as perceptual theories. These theoretical aspects will be taught in the context of their practical use. Students will be introduced to some industry standard graphics software tools so that they are familiar with how they work, but the main focus will be on programming the graphical software. The material covered in the course will be chosen so as to reflect the research carried out at Goldsmiths, University of London. The course will cover advanced 2D and particularly 3D techniques, covering a range of topics such as 3D modelling and texturing; rendering; lighting; animation; hardware acceleration in graphics; applications areas such as recreating historical environments. Students will be expected to implement basic graphics software.
Assessment: One 2 ¼-hour unseen written paper examination and coursework.

CO3320   FINAL PROJECT

Each student is required to undertake an individual project. Project work can be expected to take up at least 300 hours of a student's time. Additional software requirements: Internet access is required to widen the scope of information sources. This will also aid in obtaining some free- and share-ware.
Assessment: One preliminary report, one final report and one 2¼ hour unseen written paper.

Note: All Level 3 units are 'half-units' except for the 3320 Project