PROGRAMME SPECIFICATION

BSC CREATIVE COMPUTING

Awarding Institution	University of London
Teaching Institution	Goldsmiths College
Department	Computing
Final Award	BSc (Hons)
FHEQ Award Level	6
QAA subject benchmarking group	Computing
Date	March 2010

Background to this Programme Specification

This document is the result of the curriculum review undertaken by the Department of Computing which has resulted in a fully revised curriculum starting 2010-11. It is the specification of the BSc Creative Computing programme, which is intended to replace the existing BSc Creative Computing programme and forms part of the department's integrated suite of undergraduate programmes.

Introduction to the Programme

This programme is designed to prepare you for a career as a technology led creative in the media industries. The degree will nurture your development not just as a technical expert, but also as a creative thinker, allowing you to learn and explore through a combination of technology and imagination. Creative Computing prepares you for a career in computation for media, games and related areas by giving you both the technical understanding and the creative freedom to develop your ideas.

The programme has two core components. The first equips you with a range of key technical skills in programming for audio and visual media. These skills are delivered at the same level as traditional courses in computing, but form a specifically audiovisual perspective, giving you the tools you need to develop your ideas. The second core component gives you the freedom to use these skills in your own practical projects, creating games, applications, websites and interactive artworks that showcase your skills in creative technologies. In this way, you are encouraged to learn through experiencing the techniques of creative computation, whilst simultaneously developing your portfolio in technical arts practice.

What are the admissions criteria?

You will be expected to have at least BBB or ABC at A2 level, or equivalent.

An A2 level qualification, or equivalent, relating to science, technology and mathematics is preferred. However we encourage applications from those without a formal qualification in these areas who can demonstrate relevant knowledge, skills and experience.

All applicants may be called for an interview, at which time they may be asked to take a computer aptitude test.

If you do not have an A2 level qualification, or equivalent, relating to the sciences, you should have a good pass in GCSE Mathematics, or equivalent.

Applicants whose first language is not English must have received a score of 6.0 or more in the IELTS (or equivalent) examination for written English.

What are the aims of the programme?

The aim of this programme is to produce graduates who are independent, creative and reflective computing practitioners. Our graduates should have:

- Knowledge of computing technologies across a range of core and specialist topics
- Understanding of the contexts in which computing technologies subsist in industry, with an emphasis on the creative industries
- The ability to design and implement software systems
- The ability to work independently and in groups and reflectively evaluate their own work

What are the learning outcomes of the programme?

Knowledge and understanding

Graduates should have knowledge of:	**Taught by:**
A broad range of topics in computing including web technologies, multimedia, networking, data bases and a number of more advanced topics. Knowledge of most will be sufficient to apply to moderately complex application, some will be studied in greater depth.	A range of specialist modules including: • Data representation and data languages • Creative Audio-Visual Computing • Network Models • Data Modeling • 3rd year options
Programming languages, their features and the differences between languages. Knowledge will be sufficient for professional level software development.	This will primarily be taught in the 1st and 2nd year programming modules. Other modules will teach alternative languages and compare them to our core languages.
Uses of digital media in the creative industries and of the aesthetic principles used by digital content creators, sufficient to create professional level work	This will be taught in the first year Creative Computing module and the second year Creative Projects Module
The mathematical and computational principles underlying the representation and manipulation of digital media.	This will be taught in the Creative Audio-Visual Computing module, Creative Computing II module and in 3rd year options

Thinking (cognitive/intellectual) skills

Graduates should be able to:	**Taught by:**
Apply computational thinking to the design and implementation of moderately complex computing systems	This will primarily be taught in the 1st and 2nd year programming modules. This skill will be applied across the programme but particularly in Creative Projects and the final year project

Graduates should be able to:	Taught by:
Analyse and evaluate moderately complex computing systems and technologies with reference to efficiency, correctness and suitability to users' needs	This will be taught across the curriculum, but primarily in the programming modules, Creative Projects and the final year project
Propose, plan and evaluate a significant piece of project work, under supervision of an expert.	Final year project module
Computational Problem solving	This will primarily be taught in the 1st and 2nd year programming modules. This skill will be applied across the programme but particularly in Creative Projects and the final year project
Critical awareness and analysis of creative work, to the standards of academic study.	This will be taught in the first year Creative Computing module and the second year Creative Projects Module

Practical (including subject-specific) skills

Graduates should be able to:	Taught by:
Specify, design and implement complete computer software systems with reference to user requirements	This will be taught in Creative Computing Practice and the final year project
Program computer software to a professional level.	This will be taught in the 1st and 2nd year programming modules and applied across the curriculum and in particular in the final year project
Apply specific technologies. methods and tools to the analysis, design and implementation of software. Some technologies will be know to a basic level and others in greater depth.	A range of specialist modules including: • Data representation and data languages • Introduction to Audio-Visual Computing • Network Models • Data Modeling • 3rd year options
Acquire and manipulate digital media to a professional level.	This will be taught in the first year modules Creative Computing and Creative Audio-Visual Computing, the second year Creative Computing and Creative Projects modules and 3rd year option modules
Execute a significant piece of creative work, under supervision of an expert.	Final year project module

Transferable skills

Graduates should:	**Taught by:**
Have core numeracy, literacy and IT skills to a graudate level.	Numeracy and IT skills are core to a computing degree and will feature throughout the curriculum. Students will be required to document, describe and evaluate their work both in traditional reports and on web pages, culminating in their final year dissertation.
Be able to reflect on and evaluate their work	Students will be required to maintain a web page on which they will engage in reflective discussion of their work. The courses Introduction to Creative Computing Practice, Creative Computing Practice and final year project will have specific learning outcomes on reflection and self evaluation
Be independent and creative workers and learners	Our degree programmes have a particular focus, unusual in Computing courses, on independent and creative work, starting with 1st year programming and continuing in Creative Computing Practice and culminating in the final year project. Students will be expected to tackle complete, independent projects of their own devising from the very beginning and will be expected to independently research and learn specialist topics.
be able to work effectively in groups	Many modules will include group work but the largest scale will be the group project featured in the 2nd year Creative Computing Practice course
be able to present themselves and their work orally and in writing to a professional level.	The 1st year Computing Spectrum module will feature a section on self presentation which will then be reinforced in other modules culminating in the final year project

What courses are offered on this programme?

Year 1

The Year 1 programme will consist of the following compulsory modules:

- IS51008B (CIS115): Introduction to Programming
- [Course Code]: Data Representation and Architecture Modelling
- [Course Code]: Computing Spectrum
- [Course Code]: Mathematical Modeling for Problem Solving
- [Course Code]: Creative AV Computing
- [Course Code]: Introduction to Creative Computing Practice

Year 2

The Year 2 programme will consist of the following compulsory modules:

- [Course Code]: Programming OO Data Structures and Algorithms
- [Course Code]: Network Models
- [Course Code]: Creative Computing Practice
- [Course Code]: Data Modelling
- [Course Code]: Programming User Interfaces
- [Course Code]: Perception and Multimedia Computing

Year 3

The Year 3 programme will consist of a 60 credit compulsory independent projects and a number of optional specialist modules. These options will change from year to year but current examples include:

- IS53027A (CC342): INNOVATIVE AUDIOVISUAL PROCESSING
- IS53032A (CC349): ADVANCED GRAPHICS AND ANIMATION
- IS53002A (CIS311): NEURAL NETWORKS
- IS53008A (CIS322): USER INTERFACE DESIGN
- IS53013A (CIS323): ELECTRONIC COMMERCE
- IS53011A (CIS324): LANGUAGE, DESIGN AND IMPLEMENTATION
- IS53012A (CIS326): COMPUTER SECURITY
- IS53023B (CIS338B): DATA MINING
- IS53026A (CIS339): ENTERPRISE NETWORKING
- IS53024A (CIS341): ARTIFICIAL INTELLIGENCE
- IS53030A (CIS350): PHYSICAL COMPUTING

How will courses be taught?

The Department of Computing is committed to a diverse and stimulating range of learning and teaching methods that ensure the programme outcomes are addressed rigorously and effectively. Learning emphasises a close synthesis between theoretical understanding and practical application that helps you develop an advanced, critical approach to the subject of computing. In addition, the College's 3-D graduate scheme and personal tutoring system are opportunities to develop coherent links between seemingly disparate elements in the programme.

The various modules of the programme provide a diverse range of topics across the scope of computing but are designed to form a coherent and cumulative body of knowledge and skills. These are further developed through your independent research and learning activities directed towards course assignments and the large-scale project component. The department is committed to providing a diverse and innovative range of teaching styles across its degree programmes. These include traditional lecture and laboratory sessions but also a range of more interactive and self directed activities focusing on independent, creative work and self presentation. The nature of the learning activities will vary greatly between different modules, but includes programming, building hardware devices, software design, project planning, group activity and creative work. In addition students will be expected to engage in considerable independent reading and practical work for all modules culminating in the final year project. This independent work will be supported by library resources, access to lab space and supervision from teaching staff.

The programme provides a range of modules which provide a network of cross-referenced and cumulative knowledge across diverse areas of computing. You achieve the outcomes relevant to your individual pathway, that combines core and optional modules, through the experience of interconnected teaching and learning strategies across the various elements of the programme. All modules provide a weekly lecture-lab or other session, which reinforces preparatory or follow-up reading, and other related learning activities in both group and individual settings to foster new understandings and skills.

How will my work be assessed?

The department recognises that high quality assessment is a vital part of learning, particular when used formatively, providing valuable feedback for future learning. Our assessment is designed to reflect "real world" skills and activity in order to give our students a strong preparation for the work place.

No single method of assessment can capture all aspects of computing or the full range of skills required by our graduates. For this reason we are committed to providing many diverse styles of assessment and to the development and use of novel forms of assessment. Our methods of assessment are designed to reflect business relevant activities and to encourage independent, creative work. As well as traditional examinations, our assessment includes many different types of "hands on" practical work including software development, business planning and group work. Students will be required to present their work in a number of different ways that reflect the contemporary work place, including traditional reports but also oral presentations and extensive use of the web for self presentation. Above all we encourage our students to be independent and creative thinkers and include considerable opportunities for open ended assessments that allow students to develop their own ideas.

Feedback is vital to effective continuing learning, the true value of assessment is that it shows students how to improve their work and learn more effectively in future. For this reason we are committed to providing timely and full feedback on all assessed assignments.

Throughout the degree programme assessment will happen in individual modules, each having assignments, each including some of the many diverse styles of assessment listed above, as well as end of year exams for some modules. As well as these small assignments, students will have a major project in their final year. This is a large scale piece of work which should integrate what students have learned throughout the programme. It provides students with an opportunity to independently tackle a large project that reflects real world software development. There are many different types of project, but all including the implementation of a substantial software system and a written report.

Assessments are expected to make up roughly half of the workload of a taught course. A 15 credit course corresponds to 150 hours of work. Roughly 80 hours of this should be taken up with assessed coursework and examinations (including revision). The remainder is made up of 40 hours of contact time and a further 30 hours of private study.

Below is a list of the major types of assessment used in the department. Individual courses may vary slightly

Practical Coursework

Most of our courses will include an element of practical coursework that includes programming or otherwise creating a software system based on the material presented in the course. You will work independently, with an opportunity to ask for help in lab sessions. You will submit the finished software together with a written report or other type of documentation (oral presentation, web site, in code comments etc.). The assessment of coursework may also involve an oral examination, typically of a random selection of student or where there is suspicion of plagiarism. A 15 credit course will typically have 1 coursework and a 30 credit course will have 2.

There are five main types of coursework that we set, though individual courses may differ slightly.

Practical Coursework (worth up to 40% of a 15 credit course). This will involved answering a number of specific questions thatinvolve either creating software or hardware from scratch or editing existing software. It will typically include a report of 1-2000 words or equivalent documentation and require about 30 hours of work.

Extended Practical Coursework (worth between 40% and 80% of a 15 credit course). This will involved answering a number of specific questions that involve either creating software or hardware from scratch or editing existing software. The work involved will be more substantial than a normal coursework and will also include scope for extending that software in ways that you choose. It will typically include a report of about 3000 words or equivalent documentation and require about 50 hours of work.

Mini-project (worth between 80% and 100% of a 15 credit course). This will involve creating a substantial software system either partially or completely of your own design. It may also involve some formative working similar to a practical coursework. It will typically include a report of about 6000 words or equivalent documentation and require about 80 hours of work.

Group project (worth between 80% and 100% of a 15 credit course). This will involve creating a substantial software system in a collaboration with a group of other students. The group will submit the completed software, and each individual will write a report of about 5000 words discussing their own contribution to the software and the working of the group. Your mark will be based on the success of the project as a whole and also your contribution to it.. It will typically require about 80 hours of work.

Examined Coursework (worth 100% of a 15 credit course). Some of our courses will involve a number of practical courseworks or extended practical courseworks that are either partially or

completely assessed by a written examination. This examination will consist of questions relating specifically to the coursework.

Written Coursework

Coursework may also take the form of a written essay. This will involve applying the ideas presented in the course and doing independent research or problem solving. There are four types of written coursework that we may set.

Written Problem Sheet (worth up to 40% of a 15 credit course). This will involve written answer to a set of clearly defined mathematical or technical questions. They will typically require about 30 hours of work.

Essay (worth up to 40% of a 15 credit course). This will involve writing in answer to a question about a clearly defined topic. It will typically be about 3000 words and require about 30 hours of work.

Extended Essay (worth between 40% and 80% of a 15 credit course). This will involve writing in answer to a question about a clearly defined topic, but with more scope for independent research and choice of topic. It will typically be about 6000 words and require about 50 hours of work.

Mini-dissertation (worth between 80% and 100% of a 15 credit course). This will involve extensive independent research on a topic that is at least partially defined by you, within the scope of the course. It will typically be about 10000 words and require about 80 hours of work.

Examinations

The purpose of examinations is to test your understanding and work under timed, controlled conditions. Examinations will consist of a number of questions that you will have to answer in a limited time. They will be held in an examination hall in silence. A typical exam for a 15 credit (1 term) course will be 1hour 30 minutes long and consist of 3 questions with no choice, for a 30 credit (2 term) course it will be 3 hours and consist of 6 questions with no choice. Individual courses may have different examination arrangements. Typically you will not be allowed, notes, books or any internet access, though individual exams may allow access to certain books or web sites. There are four major types of examination used in the department:

Written Examinations. These examinations consist of a number of questions to be answered in writing. Typically this will be hand written on exam scripts provided.

Practical Examinations. These examinations will consist of a number of practical questions whose answers require programming or otherwise creative software systems. These examinations will be held in a computer laboratory with no internet access.

Mixed Written/Practical Examinations. These examinations will consist of both written and practical questions. These examinations will be held in a computer laboratory with no internet access.

Coursework Examinations. These are written examinations where the questions are specifically about practical coursework that you will have done during the course (see above).

What do I need to do to progress between levels?

To be confirmed based on college regulation to be published

What are the grading criteria for a BSc (Hons) degree?

Mark	Descriptor	Grading Criteria
0%	Non submission	Work was not submitted or it was plagiarised
1-9%	Very bad fail	A submission that does not even attempt to address the specified learning outcomes (shall be deemed a non valid attempt and unit must be re-sat).
10-24%	Bad fail	Represents a significant overall failure to achieve the appropriate learning outcomes (shall be deemed a valid attempt and not necessarily required to be re-sat).
25-34%	Fail	Represents an overall failure to achieve the appropriate learning outcomes.
35-39%	Pass	Represents the overall achievement of the majority of the appropriate learning outcomes to a pass level. Does not satisfy the requirements for honours level performance, but displays some understanding of concepts, methodology and content. Students should be able to demonstrate creating a very basic computing system under guidance from tutors. Students achieving an overall mark of between 35-39% at degree level will be awarded a pass (non honours) degree.
40-49%	Threshold	Represents the overall achievement of the appropriate learning outcomes to a threshold level (honours). Demonstration of a limited level of understanding of relevant concepts, methodology and content; clear if limited attempt to tackle problems; display of some skill in organisation of material. Students should demonstrate creation of a basic, complete and working computing system/program.
50-59%	Good	Demonstration of an adequate level of understanding of relevant concepts, methodology and content; display of sufficient skill to tackle some complex problems; appropriate organisation of material. Students should demonstrate the ability to create complex computer software, making use of prior knowledge and material taught within the program

Mark	Descriptor	Grading Criteria
60-69%	Very Good	Demonstration of a sound level of understanding based on a competent grasp of relevant concepts, methodology and content; display of skill in interpreting complex material; organisation of material at a high level of competence. Students should be able to demonstrate the ability to independently design, implement and evaluate a high quality and complex computer systems using knowledge from across the program.
70-79%	Excellent	Demonstration of a thorough grasp of relevant concepts, methodology and content appropriate to the subject discipline; indication of originality in application of ideas, in synthesis of material or in implementation; insight reflects depth and confidence of understanding of the material. Students should be able to design and create computer systems that demonstrate considerable independent thought and are based on independent learning of prior work and existing technologies. Students should be able to critically evaluate their own work.
80-100%	Exceptional	Represents an exceptional achievement beyond the standard requirements of a first class degree. Students' work should demonstrate considerable creative thought and be based on a critical evaluation of prior work. Work is likely to achieve some outcomes that would be expected at a higher level degree

What support can I expect?

Expertise is provided by the Departments' resident staff who are dedicated and experienced teachers, but also distinguished practitioners and researchers in their own right, working in national and international contexts. The Departments also draw on a large pool of visiting tutors and researchers, to provide a breadth of expertise and contact with current research and practice.

Student learning is supported by the Rutherford Information Services Building, which houses extensive book, score, CD/DVD and electronic resources. All registered students also have access to the University of London libraries network. In addition, the Department of Computing has extensive computer lab facilities. The Department make extensive use of the VLE learn.gold online facility, in order to support student learning in a number of ways, including the dissemination of learning resources and to provide an electronic forum for the exchange ideas and debate.

The BSc curriculum is supported by a wide range of activities that encourage awareness and involvement in the Department's high profile practical and research activities, including termly postgraduate conferences, the Digital Studios' 'Thursday Club', the Whitehead Lectures, workshops, visiting speakers, and various other activities of the Digital Studios. Further information about these groups can be found from the Departments' web pages www.gold.ac.uk.

You are allocated a personal tutor during your period of study who offer advice, guidance or clarification of courses, options, requirements and regulations; and to monitor your progress through the programme. The Personal Tutor can also offer support in cases of academic difficulty. Should further advice be necessary, the Senior Tutor, the Chair of the Sub-Board of Examiners can also be consulted. If you encounter difficulties at any time with your studies, the programme convenor and other course tutors can provide additional academic support whilst the Senior Tutor is available by appointment to discuss welfare-centred issues. Staff members have office hours each week to discuss any matters; outside these hours students may arrange an appointment with staff via email or telephone.

The Department of Computing takes advantage of and pursue the College's Disability Awareness policies. Students with specific needs in this regard are considered on an individual basis. The College also actively supports students with specific learning difficulties (e.g. dyslexia), and provisions are made to ensure that all students, regardless of specific difficulty/disability, derive full benefit from the learning environment. In addition to specialist advice and assistance within the College, the Department ensures that course materials are suitable for all students and, where necessary, these are altered to meet the requirements of individual students.

You will develop and maintain a personal development plan, run by the Goldsmiths 3-D Graduate scheme, during your course of study. This helps you record aspirations, plans and goals, record your achievements, and enables progress to be monitored, in order to help achieve your individual aims. The Senior Tutor is available to discuss the 3-D scheme with students, and the Department will advise you about how best to approach this task.

The medical, counselling and financial services provide support for students when necessary, and in the case of students with special needs (including dyslexia), the Student Support Office will provide sympathetic advice and help. Goldsmiths also provides a wide range of other support services for students, which can be found on its web site at www.gold.ac.uk. Overseas students whose first language is not English may seek assistance from the Goldsmiths English Language Unit.

The Department is committed to making any reasonable adjustment that allows, as far as possible, for equality of opportunity and access, and to ensuring that students are not substantially disadvantaged because of specific learning difficulties or disability.

What Careers will be open to me?

Visual interface design; computer graphics; games and animation; music production and cataloguing services; multimedia systems analysis; research and development in media and entertainment; Film/television production and special effects companies. Employers increasingly demand that new recruits are able to add immediate value to their organisation. Because this programme offers the option of an industrial placement year, students can demonstrate that they have already achieved a certain level of professional competence and maturity, which could help you stand out in the job market.

How will teaching quality be monitored?

The Department is committed to effective programme monitoring, in which representatives from the BSc programme can comment about the programme, the Department and provision for learning, teaching, assessment and related activities. Student representatives contribute to the undergraduate Staff-Student Forums run by the Department: termly meetings that are minuted and report to the Department. Student representation is also included in the membership of the Department Board, meeting several times over the academic year. The BSc programme participates in the College's procedures for course evaluation, including the National Student Survey, and students are strongly encouraged to participate in this process. Course leaders are encouraged to actively seek and respond to student responses.