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To whom it may concern

Please find attached the Module Descriptors, taken from the official UTREG Module Specification forms.

These are the modules Jacob Sandve studied during 2011 to 2014 when he was enrolled on BSc (Hons) Computer Games Programming.

If you require any further details please do not hesitate to contact me.

Regards



Miss L Waugh-Rumbellow

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School of Computing  
Teesside University  
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2011/12

### **Programming (VIS1038-N)**

This is an introductory course to programming with an emphasis on the learning, development and application of algorithms and data structures in a computer game context. The students will learn to think, design and program using object-oriented methods.

Students will be required to demonstrate conceptual understanding and practical competence at programming by designing and developing solutions to specific programming problems and the development of a relevant application.

### **Games Middleware (VIS1037-N)**

In this module students will learn how to create a 3D interactive environment using a game middleware. Students will use a game engine to develop their own 3D game.

This module covers the set of programming techniques and concepts related to the creation of a modern computer game using industry-standard middleware products.

The module also aims to introduce students' game programming skills in general and illustrate game middleware components and their utilisation.

This module covers the game production pipeline and the issues faced when using industry-standard middleware.

The module will be assessed by a two-part ICA, weighted at 75:25.

### **Games Technology (VIS1031-N)**

This module will focus upon the underlying hardware and technology used in Computer Games.

Exploration of the technology will encompass consideration of the general principles of digital computers, the underlying technology, as well as the specifics of games technology. Games technology will be explored in the context of games development, with reference to the interconnection of hardware and the developmental processes involved in games' creation.

Participants will be encouraged to consider the development process and appreciate the various technologies, in both software and hardware that must be brought together in the creation of a Computer Game.

In addition, there is an emphasis on the development of professional skills including teamwork, report writing and delivering presentations. Structured and supported Personal Development Planning (PDP) activities such as self-assessment, planning and reflection will be undertaken by students who will also be encouraged to record such activities in their e-portfolio.

The module will be assessed by a two-part ICA, weighted 75:25.

### **Mathematics (COM1048-N)**

This module develops the mathematical ability of students and provides the mathematical skills required in computer games and graphics programming, including vectors, matrix transformations and vector descriptions of lines, curves and surfaces.

Mathematical techniques are applied to the scaling, translation and rotation of shapes in two and three dimensions. These methods are based on straightforward ideas of geometry, trigonometry and calculus which will be developed from first principles.

The module also covers topics in discrete mathematics which form the basis of the notation used in the specification of software.

The module is assessed by three open book tests during the academic year.

### **Systems Design (COM1047-N)**

This module introduces students to the systems development life cycles and processes. It shows how object-oriented analysis and design techniques can be used early in the life cycle and how project management and quality control techniques can be applied throughout the life cycle. Software tools are used to support the modelling and management of systems. Methods, and how techniques fit into them, are introduced.

The module is assessed with one written examination.

**2012/13**

### **Games Software Development (VIS2069-N)**

This module concentrates on the skills and knowledge required in the development of a computer game. The focus is on the issues that would be faced daily by a programmer working in a games development team. This module will consider different game genres, game play techniques and game flow alongside the more technical areas of user interface programming, sound and music.

There is an emphasis on the development of employability skills including CV creation and preparation for industrial placement, and on raising awareness of the enterprise support available at the University for students. Students will be given the opportunity to further develop their Personal Development Planning skills from first year and contribute to the ongoing development of their e-portfolio.

The assessment will involve the design and implementation of game play code to a typical game design specification plus an electronic portfolio presenting the work

### **Artificial Intelligence Programming (VIS2067-N)**

This module introduces students to the tools and techniques required to build practical solutions to many well established problems in Artificial Intelligence (AI). The problems covered will span across AI issues in both Computer Science and Computer Games. The module introduces important issues (e.g. knowledge representation and inference) which underpin much of symbolic AI.

Students will be given a solid grounding in using Lisp as a language for symbolic computation – developing rules and other declarative knowledge structures as well as building simple inference mechanisms.

The module is assessed by in-course assessment.

### **Network and Concurrent Programming (VIS2064-N)**

This module will give an overview of networking protocols and related APIs (application programmer interfaces), and familiarize the students with concurrent and distributed programming paradigms.

Issues faced when developing a concurrent or distributed application will be tackled, including security and synchronization issues.

Examples of abstractions will be studied, including concurrency design patterns, distributed objects models and architectures.

Assessment will be 100% ICA, and include programs and a report.

### **Mobile Games Programming (VIS2063-N)**

This module will provide the student with an overview of the technologies available for developing games for mobile platforms.

The module will also provide an understanding of the issues faced when programming for a mobile device, through the use of suitable platforms and middleware.

Among the themes covered will be the design of user interfaces, quality of services in mobile networks, and concurrency and mobility issues.

Assessment will be done through an in-course assessment weighted at 60:40. The main component of the ICA will require the development of a simple 2D game. Other components will involve personal research and group work.

### **Animation and Simulation Programming (VIS2052-N)**

This module introduces students to the essential 3D animation and simulation techniques used within computer games and graphics programming.

After completing this module the students will be able to program common animation and simulation techniques to interactively evolve a virtual 3D world. Drawing of the virtual world will be handled by a suitable high-level API library.

Emphasis is on the practical implementation of the theories; as such an in-course assessment will be used requiring the student to design and implement a portfolio of solutions to case studies defined by the tutor.

The module is assessed by in-course assessment.

### **Games Engine Construction (VIS2068-N)**

This module concentrates on the design of the core computer game system and how it may be implemented. Using an industry style Application Programmer Interface (API) and object oriented programming a game engine will be developed. This will involve implementing and integrating the commonly required components e.g. graphics, world, input. Particular consideration will be given to code reuse and 'black boxing' of game components.

The assessment will be in the form of a small game demo showing off the working game engine.

2013/14

### **Advanced Games Development (VIS3073-N)**

This module is designed to provide students with experience of working as a member of a games development team that is as close to industrial practise as possible. It will be aimed at simulating the working criteria and mix of development skills that are required to produce a computer game.

The assessment is a group assignment in which team members will develop a working game, product specification and individual report. This will consist of 2 components weighted at 30/70.

### **Artificial Intelligence Applications (VIS3071-N)**

Artificial Intelligence is concerned with the science and engineering of intelligent machines. It is a cross disciplinary subject considering aspects of cognitive psychology, linguistics and philosophy as well as computer science. More recently the computer science focus of AI has become increasingly interested in building "intelligent agents" – systems that perceive their environment and take actions to maximise their chances of achieving their goals. The development of modern

compelling computer games is building upon the AI knowledge of "intelligent agents" applied to virtual environments.

This module covers the tools and techniques of intelligent systems engineering and an in-depth study of key research and application areas of intelligent systems in both computer games and computer science. Tools and techniques include problem solving, planning, expert systems and knowledge representation.

The module also investigates aspects of psychology and linguistics but primarily focuses on computing sciences and includes an introduction to the practical skills necessary for building intelligent systems software whether for real-world problems or virtual environments such as computer games environments.

The module is assessed by in course assessment.

### **Multiplayer Games Programming (VIS3067-N)**

This module will give the students the opportunity to learn about the specificities of multiplayer networked games. Domain specific techniques, covering latency-hiding strategies, persistence and synchronisation in virtual worlds, group communication models, cheating and security issues and how to evaluate multiplayer games playability will be described.

Classical and innovative game genres architectures and deployment will be studied.

Students will be given the opportunity to experiment and practice with the issues studied through the use of suitable middleware and libraries.

Students will be assessed through an in-course assessment, which will be composed of a program, a critical essay, and a short viva.

### **Games Device Programming (VIS3065-N)**

This module aims to expand the student's knowledge and skills of computer games software development to include high-performance development for games hardware. It is relevant to those seeking employment in the computer games industry as programmers or those aiming to produce high-performance game libraries and engines.

The module will build upon and expand the games software programming skills and knowledge developed previously on the student's pathway. New skills will focus on developing, analysing and optimising code for specific games hardware.

This module's emphasis is on the creation of high performance software optimised for a more limited gaming device; thus an in-course assessment will be used requiring the student to implement a game demo to a specification defined by the tutor.

## **Computing Project (COM3051-N)**

The Computing Project is a large scale piece of work, undertaken by the student under the supervision of a member of the academic staff. The project involves the production of a substantial artefact related to the computing field and culminates in the writing of a report and a viva consisting of the presentation, demonstration and discussion of the artefact.

Students are guided to develop an appropriate sense of work-discipline coupled with a professional outlook. They are expected to take responsibility for the planning and execution of an extended piece of work including the consideration of associated legal, social, ethical and professional issues. Students are able to explore in depth a chosen subject area, and thereby demonstrate the ability to analyse, synthesise, and creatively apply what has already been studied on the programme whilst demonstrating critical and evaluative skills and professional awareness.