

## PROGRAMME SPECIFICATION – POSTGRADUATE PROGRAMMES

### KEY FACTS

Programme name	MSc Computer Games Technology with VR
Award	MSc
School	School of Science & Technology
Department or equivalent	Department of Computer Science
Programme code	PSCGTH
Type of study	Full Time    Part Time
Total UK credits	180
Total ECTS	90

### PROGRAMME SUMMARY

This course is designed for graduates of computing-related degrees who want to develop their career in the games and VR industry by further specialising their existing undergraduate education or who wish to update their skills after time in industry as a computing professional, and for those with equivalent experience.

This course is generally delivered during the day for both full-time and part-time students, but some modules may be taught in the evening. Both full and part-time students study eight modules in total, with a further project component on completion of the taught section.

In particular, the project component gives students an opportunity to carry out an extended piece of work under the supervision of one of our specialist academic and research staff, at the cutting edge of games and VR technology, in an industrial or academic context.

Specific modules include:

- Computer Graphics
- Virtual Reality Development
- Computer Game Architecture

The Games Development ProcessThe majority of modules use C++ or C#. No prior knowledge of these languages is assumed, but students must be proficient in programming prior to enrolment.

This programme has been developed in accordance with the QAA Subject Benchmark for Computing.

Typically, students will complete the entire course, culminating in an MSc. However the course is designed to have three exit points:

**POSTGRADUATE CERTIFICATE IN COMPUTER GAMES TECHNOLOGY WITH VR**

The first exit point is the Postgraduate Certificate in Computer Games Technology with VR, which you achieve through successful completion of four taught modules. At this stage you will have knowledge and of the underlying concepts and programming skills associated with computer games technology and VR.

The postgraduate certificate will enable you to develop confidence in your knowledge and skills in a career in computer games technology.

### ***POSTGRADUATE DIPLOMA IN COMPUTER GAMES TECHNOLOGY WITH VR***

You will achieve a Postgraduate Diploma in Computer Games Technology with VR through successful completion of the eight taught course modules. At this stage you will have deep understanding of computer games technology and VR, in terms of theory and practice using game engines and industry-standard programming languages.

The postgraduate diploma will provide you with an extended repertoire of skills needed as you develop into an experienced professional and introduce you to the broader theories and techniques related to computer games technology.

### ***MSc IN COMPUTER GAMES TECHNOLOGY WITH VR***

For the MSc, in addition to successfully completing the eight taught modules, you must successfully complete the Individual Project module INM363. In this module, you will explore an aspect of computer games technology in depth, involving a systematic literature review, development, and analysis of computer program.

By completing the MSc you will further develop a coherent, systematic, detailed knowledge of your discipline. You will be able to develop techniques for practice, drawing on research and scholarship demonstrating your role as a reflective practitioner.

### **Aims**

The course aims to develop:

- strong technical skills suitable for professional programming roles in the games and VR industry;
- specialist knowledge in computer graphics, VR, AI, physics and audio;
- the ability to design and build game engines from scratch in industry standard languages, including C++;
- the ability to design and build a VR/AR experience using industry standard tools;
- experience of the planning, management and execution of a major games technology or VR project;
- knowledge of the game development process, including the pitch, design, and use of a game engine to build a demo.

## **WHAT WILL I BE EXPECTED TO ACHIEVE?**

**On successful completion of this programme, you will be expected to be able to:**

### Knowledge and understanding:

- Demonstrate a deep knowledge of a range of advanced aspects of computer game and VR technology.
- Demonstrate an ability to independently develop a technical computer game and VR project.
- Demonstrate an ability to develop computer games software using applicable programming languages.
- Demonstrate a systematic understanding of graphics, physics, artificial intelligence and audio technologies and their applications within computer games and VR.

### Skills:

- Apply advanced knowledge in computer game and VR technology.
- Independently plan, manage and execute a major extended practical application of computer games technology.
- Develop and give presentations to a high professional standard.
- Apply the ability to learn and develop games and VR software using appropriate programming languages and concepts.
- Perform independent and efficient time management.
- Apply advanced concepts in software system design to game and VR development.

### Values and attitudes:

- Act as professional IT consultants fully aware of the legal, ethical and professional issues which arise in projects concerned with the development and management of software systems.

## **HOW WILL I LEARN?**

You will learn via a mix of learning and teaching strategies.

In taught modules you will learn through lectures and tutorials. Fundamental concepts are introduced in lectures. You will then apply the concepts in small exercises and in practical work in supervised tutorials.

In addition, you will engage in self-directed study to deepen your understanding,

during which you will read recommended materials, engage in reflective exercises, participate in seminars and tutorials, and prepare for formative and summative assessments.

Some of the assessments and exercises will involve group work to enable you to learn how to work effectively in teams and learn other transferable skills.

The face-to-face teaching is supported via online tools which will also enable feedback and engagement via discussion forums and the dissemination of additional material made available to you.

## **WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?**

### Assessment and Assessment Criteria

Assessment is within each module, including the dissertation. Assessment methods vary according to the nature of the material. Individual written assignments and exercises are the norm, but some modules may use other methods, including individual practical exercises, group work projects and unseen examination papers. Most assessments have an element of choice, allowing students to focus on aspects of interest to them.

Assessment Criteria are descriptions, based on the intended learning outcomes, of the skills, knowledge or attitudes that you need to demonstrate in order to complete an assessment successfully, providing a mechanism by which the quality of an assessment can be measured. Grade-Related Criteria are descriptions of the level of skills, knowledge or attributes that you need to demonstrate in order to achieve a certain grade or mark in an assessment, providing a mechanism by which the quality of an assessment can be measured and placed within the overall set of marks. Assessment Criteria and Grade-Related Criteria will be made available to you to support you in completing assessments. These may be provided in programme handbooks, module specifications, on the virtual learning environment or attached to a specific assessment task.

### Feedback on assessment

Feedback will be provided in line with our Assessment and Feedback Policy. In particular, you will normally be provided with feedback within three weeks of the submission deadline or assessment date. This would normally include a provisional grade or mark. For end of module examinations or an equivalent significant task (e.g. an end of module project), feedback will normally be provided within four weeks. The timescale for feedback on final year projects or dissertations may be longer. The full policy can be found at:

[https://www.city.ac.uk/data/assets/pdf\\_file/0009/452565/Assessment-and-Feedback-Policy...pdf](https://www.city.ac.uk/data/assets/pdf_file/0009/452565/Assessment-and-Feedback-Policy...pdf)

## Assessment Regulations

In order to pass your Programme, you should complete successfully or be exempted from the relevant modules and assessments and will therefore acquire the required number of credits.

The pass mark for each module is 50%.

If you fail an assessment component or a module, the following will apply:

1. Compensation: where you fail up to a total of 20 credits at first or resit attempt (15 for a Postgraduate Certificate), you may be allowed compensation if:
  - Compensation is permitted for the module involved (see the What will I Study section of the programme specification), and
  - It can be demonstrated that you have satisfied all the Learning Outcomes of the modules in the Programme, and
  - A minimum overall mark of no more than 10% below the module pass mark has been achieved in the module to be compensated, and
  - An aggregate mark of 50% has been achieved overall.

Where you are eligible for compensation at the first attempt, this will be applied in the first instance rather than offering a resit opportunity.

If you receive a compensated pass in a module you will be awarded the credit for that module. The original component marks will be retained in the record of marks and your original module mark will be used for the purpose of your Award calculation.

2. Resit: Where you are not eligible for compensation at the first attempt, you will be offered one resit attempt.

If you are successful in the resit, you will be awarded the credit for that module. The mark for each assessment component that is subject to a resit will be capped at the pass for the module. This capped mark will be used in the calculation of the final module mark together with the original marks for the components that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your resit by the date specified you will not progress and the Assessment Board will require that you be withdrawn from the Programme.

If you fail to meet the requirements for the Programme, the Assessment Board will consider whether you are eligible for an Exit Award, as per the table below.

If you would like to know more about the way in which assessment works at City, please see the full version of the Assessment Regulations at:  
<https://www.city.ac.uk/about/governance/policies/student-policies-and-regulations>

## WHAT AWARD CAN I GET?

### Master's Degree:

	HE Level	Credits	Weighting (%)
Dissertation	7	60	33
Taught	7	120	66

Class	% required
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With Distinction	70
With Merit	60
Without Classification	50

### Postgraduate Diploma:

	HE Level	Credits	Weighting (%)
Taught	7	120	100

Class	% required
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With Distinction	70
With Merit	60
Without Classification	50

### Postgraduate Certificate:

	HE Level	Credits	Weighting (%)
Taught	7	60	100

Class	% required
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With Distinction	70
With Merit	60
Without Classification	50

## WHAT WILL I STUDY?

Eight taught modules. Six are compulsory. The seventh is a choice between Software Systems Design (INM330), and Advanced Games Technology (INM710). The eighth is a choice between Digital Signal Processing and Audio Programming (INM378), Computer Vision (INM460), Deep Learning: Optimization (INM707), Neural Computing (INM427), Project Management (INM372), Virtual Reality Development (INM717) and Entrepreneurship in Practice (INM462). This is followed by the dissertation component. Optionally, the dissertation can be carried out within a period of internship.

### Taught component

The taught component is taken in one of two standard length patterns: full-time (one year) and part-time (two years).

Module Title	SITS Code	Module Credits	Core/ Elective	Can be Compensated?	Level
Software Systems Design	INM330	15	E	Y	7
Advanced Games Technology	INM710	15	E	Y	7

Object Oriented Programming in C++	INM359	15	C	Y	7
Research Methods and Professional Issues	INM373	15	C	Y*	7
Games Development Process	INM375	15	C	Y	7
Computer Graphics	INM376	15	C	Y	7
Computer Games Architectures	INM379	15	C	Y	7
Virtual Reality Development	INM717	15	C	Y	7
Digital Signal Processing and Audio Programming	INM378	15	E	Y	7
Computer Vision	INM460	15	E	Y	7
Deep Reinforcement Learning	INM707	15	E	Y	7
Project Management*	INM372	15	E	Y	7
Neural Computing	INM427	15	E	Y	7
Entrepreneurship in Practice	INM462	15	E	Y	7

\* Compensation will only be applied at resit.

#### Dissertation component

A dissertation project of 60 credits is required for the Masters award.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be Compensated?	Level
Individual Project	INM363	60	C	N	7

INM373 Research Methods and Professional Issues must be passed with a mark of at least 50% without compensation to proceed with INM363 Individual Project.

#### **TO WHAT KIND OF CAREER MIGHT I GO ON?**

This programme will provide you with an opportunity to enhance your career prospects in games technology and VR related disciplines. The subjects studied will provide a strong grounding for technical roles, including programming and design of game engines, VR, AI, graphics, physics and audio systems. Production and management roles are also available as career paths. Further, the technical nature of the course gives graduates a strong grounding in programming-based roles outside the games and VR industry. Graduates may also choose to continue onto a PhD programme (subject to successful application).

Alumni have previously taken positions at games companies such as: Criterion, Rock Star Games, Sony, and Sega; as well as Google and Accenture.

If you would like more information on the Careers support available at City, please go to: <http://www.city.ac.uk/careers/for-students-and-recent-graduates>.

### **WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?**

Students who successfully complete the taught part of their course without re-sits have the option of doing an internship on which they can base their dissertation. The internship period is from July to December. Students produce an internship-based proposal along with a back-up non-internship-based proposal by the deadlines stipulated in the MSc Project Guidance Document.

As well as the support of their academic supervisor, students on internship are supported by a work-based learning advisor from the Professional Liaison Unit.

Further details of the Postgraduate Internship Scheme are available from the Professional Liaison Unit - <http://www.city.ac.uk/informatics/professional-liaison-unit>

### **WILL I GET ANY PROFESSIONAL RECOGNITION?**

Accredited by BCS The Chartered Institute for IT as partially meeting the educational requirement for CITP registration for a period of 5 intakes from the 2017 intake, up to and including the 2021 intake, in the full time and part time modes.

Please contact BCS directly for information about partial accreditation and further details regarding the CITP registration process: <http://www.bcs.org>.

### **HOW DO I ENTER THE PROGRAMME?**

Each application is considered on its merits and is given full consideration by admissions staff.

The usual minimum entrance requirement is a good second class honours degree from a UK university, a recognised equivalent from an accredited overseas institution or an equivalent professional qualification.

Applicants should have previous exposure to computing, acquired either as part of a previous degree or through professional experience; in particular, applicants should have good programming skills, preferably in an OO language.

For those students whose first language is not English, the following qualification is also required:

- IELTS: 6.5 (minimum of 6.0 in all four components)

To ensure that students are properly prepared for study, and to maximise the benefit gained from the course, admissions staff will also take close account of the areas and nature of previous academic and other achievements.

Version: 9.0

Version date: February 2024

For use from: 2024-25