Module Title/Name: **Computer Animation**	Module Code: **CS2420**
School: **Engineering and Applied Science**	Module Type: **Standard Module**
New Module? **No**	Module Credits: **10**

Module Management Information

Module Leader Name	Ulysses Bernardet
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Additional Module Tutor(s):
None Specified

Level Description: Level 5 (Foundation Degree/Dip He)	**Programmes in which available:** Bachelor of Science - Computer Science. Bachelor of Science - Computer Science with Multimedia. Bachelor of Science - Computing Science and Mathematics.
Contributing School & Subject Groups (and %): None Specified	**Credit Value & ECTS Credits:** 5

Available to Exchange Students?

Module Dependencies

Pre-requisites: (CS2150).	**Co-requisites:** None Specified

Prohibited Combinations:
None Specified

Module Learning Information

Module Aims:
Computer Animation is a discipline that uses the computer to assist in the creation of animated sequences. As 3D animated content becomes more prevalent, CA is rapidly becoming a central component of the modern creative industries. At the core of CA lies a multitude of cutting edge computer algorithms, advanced graphics as well as powerful hardware. This makes CA one of the most exciting topics of modern computer science, driving developments in other fields like graphics, virtual/augmented reality and out-of-core computing. This module aims to provide students with an in depth understanding of CA from a computer science

perspective. We will be looking "under the bonnet" of modern CA software packages, attempting to make sense of the key concepts and algorithms involved in making a piece of animation. This module DOES NOT aim to turn students its CA creative artists, although it may motivate some to pursue further training in practical CA. Rather, our aim is to provide students with enough technical experience to be able to make informed decisions about the use of specific CA techniques, and perhaps contribute to the development of future CA software packages.

Module Learning Outcomes:
LO1. Theory and principles of computer animation
LO2. Evaluate the benefit of applying animation in different situations and select appropriate animation techniques
LO3. Use of Blender for creating short 3D animation features
LO4. Project management skills

Indicative Module Content:
Introduction to animation
Display pipeline
Keyframing Interpolation
Orientation representations
Grid deformation
Forward/Inverse kinematics
L-systems
Particle systems
Rigid body simulation
Motion Capture Technologies

International Dimensions:
None Specified

Corporate Connections:
None Specified

Ethical Approval:
None specified

Links to Research:
Research involving Computer Vision technologies for capturing 3D assets, facial motion capture as well as several examples and case studies based on research for the past 5 years.

Ethics, Social Responsibility and Sustainability:
None Specified

Module Delivery

Methods of Delivery & Learning Hours (by each method):

Method of Delivery	Learning Hours
Large Group Activity:	10 hours
Small Group Activity:	3 hours
Specialist Session Activity:	7 hours
Independent Activity:	80 hours
Total Learning Hours:	**100 hours**

Learning & Teaching Rationale:
The module has two components:
1. Theory of 3D computer animation
This is taught during lectures and tutorials and consists of a mixture of topics surrounding the mathematics of animation, 3D transformations, interpolation and others.

2. Practice of 3D computer animation
This involves using a professional animation software package to generate simple 3D animations. It is taught through a series of lab sessions so that students get first hand experience of how the theory they have been taught in lectures applies in practice.

Module Assessment

Methods of Assessment & associated weighting (including approaches to formative assessment as well as summative):

Assessment Type	Category	Duration/ Submission Date	Common Modules/ Exempt from Anonymous Marking	Assessment Weight
February to June Exam	**Open Book**	**1:30hrs**	**-**	**60%**
Details	24hr Take-away Assessment			
Practical	**Individual Assignment**	**-**	**-**	**7%**
Details	-			
Coursework	**Individual Assignment**	**-**	**-**	**33%**
Details	An extended 3D computer animation coursework that asks students to create a short (1-2 minute) animation sequence. The task is meant to put to the test most of the techniques taught in the module plus a few extra ones that students are expected to find online. The aim is to teach students how to think like animation designers, utilising the right set of techniques for achieving each desired effect.			
			Total:	**100%**

Method of Submission:
Both Hard Copy and Electronic Copy

Assessment Rationale:
Assessment is closely aligned with the structure of this module. The theoretical component (LO1) is assessed through traditional exam methods while the practical side (LO2, LO3, LO4) is assessed with a series of lab sessions and lab-based coursework.

Feedback Rationale:
Feedback to the students will be provided during the two-hour lab sessions. Each lab session involves an assessed component on which brief feedback will be given on a weekly basis.

The longer piece of coursework will be handed in towards the end of the Teaching Period. Detailed written feedback will be provided on that work.

Also, during lectures students will be asked to go through worked examples and problems. During these sessions feedback will be provided to individual students.