<table>
<thead>
<tr>
<th><strong>Module Code</strong></th>
<th>CS7033</th>
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<tbody>
<tr>
<td><strong>Module Name</strong></td>
<td>Real-time Animation</td>
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<tr>
<td><strong>Module Short Title</strong></td>
<td>N/a</td>
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<td><strong>ECTS weighting</strong></td>
<td>5</td>
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<tr>
<td><strong>Semester/term taught</strong></td>
<td>Michaelmas term</td>
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</table>
| **Contact Hours** | Lecture hours: 2  
Lab hours: 1  
Tutorial hours:  
Total hours: 3 |
| **Module Personnel** | Assistant Professor Rachel McDonnell |

**Learning Outcomes**  
When students have successfully completed this module they should be able to:

- Demonstrate a fundamental understanding of real-time animation algorithms and techniques that would be employed in a typical game.
- Develop and explain code that performs different methods of rotation interpolations.
- Develop and explain plug-ins for behavioural animation routines using Boids steering.
- Demonstrate, both orally and in written form, the ability to gather, analyse, and propose a project based on relevant literature in real-time animation and physics.

**Module Learning Aims**  
The aim of this course is to provide students with a deep understanding of the theory and techniques behind real time animation. We will explore computer animation and advanced issues such as behavioural animation and motion capture and also look at specific fundamental concepts such as interpolation.
Specific topics addressed in this module include:
- Splines and curves
- Key-frame techniques
- Quaternions for rotations / orientations
- Blending and interpolation
- Motion capture systems
- Motion Retargetting
- Motion graphs and character control
- Animation data representations
- Behavioural Animation
- Facial Animation
- Motion quality metrics
- Perception in animation

**Recommended Reading List**

  - *Advanced Animation and Rendering Techniques*, Watt and Watt.

**Module Pre Requisite**

C++, OpenGL or equivalent 3D graphics library.

**Module Co Requisite**

**Assessment Details**

Students will undertake three smaller individual programming coursework assignments as well as one larger final project involving the development of a project proposal in real-time animation and physics. Students will be marked on the proposal and their oral presentation.