

 University of Southampton	School of Electronics and Computer Science	Coursework (3 of 4) Instructions
Module: COMP 3214	Title: Principles of Computer Graphics.	Lecturer: Dr. J N Carter
Deadline: see handin	Feedback: + 4 working weeks.	Weight: 5%

Instructions

Introduction

This coursework is designed to give you a little experience using the Bullet Physics Engine to bounce spheres, cubes or any other objects around the inside of a cubic cell. This should encourage/enable you to use Bullet in the final coursework.

Other than the physics element it is based entirely on your experience with coursework 1. You will find that most of the graphics component that you will need already exist.

This is not a graphics project. There will be no marks for the graphics program demonstrating the moving, bouncing and colliding objects. A minimal display showing the position and orientation of your objects is required so that their motion can be appreciated.

On-line you will find an example program, which restricts motion of spheres to the x/z plane only, together with instructions on using it with the Bullet framework. Use this together with your code for Coursework 1 as a starting point.

Deliverables.

The deliverables of this coursework are:

A program that bounces at least *2 spheres and one cube* around a cubic arena with gravity off and a coefficient of restitution of 1.0, i.e. perfect loss less bounces.

The program should use a header file called world.h which will allow the simulation to be easily build with different parameters

The file should look like this

```

/*
 * simulation parameters
 */
#define GRAVITY -9.81
*/
*Defined in the z direction
*
#define COE 1.0
/*
 * Coefficient of restitution.
 */

```

You may include any other global parameter as you see fit.

Like coursework 1 and 3 this will be marked by its on screen appearance.

Submission

You should submit your working source code via the hand-in system and should obey all the specific rules on the coursework web page.

Relevant Learning Outcomes (LOs)

1. Become familiar with the Bullet Physics Engine.
2. Show an understanding of how forces and collisions are implemented.
3. Demonstrate the ability to insert fixed shape objects and track them as they bounce around an arena.

Marking Scheme

<i>Criterion</i>	<i>Description</i>	<i>LOs</i>	<i>Mark/5</i>
Basic Program	A functional Program, with a 3D box.	1	1
Force & Collisions	Defining gravity, coefficient of restitution.	2	1
Spheres	At least two spheres	3	2
Non spherical object	At least one non spherical object such as a cube.	3	1

The handin page is always the correct version.

*Late submissions will be penalised at 10% per working day. No work can be accepted after feedback has been given.
You should expect to spend up to 8 hours on this assignment. Please note the University regulations regarding academic integrity.*