



DUBLIN INSTITUTE OF TECHNOLOGY

**DT211C BSc. (Honours) Degree in Computer Science
(Infrastructure)**

Year 4

DT228 BSc. (Honours) Degree in Computer Science

Year 4

SUMMER EXAMINATIONS 2016/2017

GAMES ENGINES 2 [CMPU4031]

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FRIDAY 19TH MAY 9.30 A.M. – 12.30 P.M.

THREE HOURS

To be assessed as an *online* laboratory-based test

This is a closed book test worth 30% of your grade for this subject

Use of Unity API reference and Visual Studio API reference websites is permitted

Use the test submission link you will have received by email

Submit your test by committing your code to github

The goal of this test is to create the AI for the blue resource gathers depicted in the video link you will have received by email.

Description:

- The yellow boxes in the video represent flowers that contain pollen, a resource that the bees want to collect. Bees are represented by the blue boxes with the wings. The bees collect pollen from the flowers and bring it back to the hive. The hive is represented by a purple box.
- The hive can create a maximum of 10 bees at a rate of 1 every 2 seconds. A bee costs 5 units of pollen to make. The hive starts with 10 units of pollen and so it will be able to make 2 bees initially.
- As the bees collect more pollen, the hive makes more bees.
- Bees have the following behaviour:
 - Bees explore their environment looking for flowers.
 - To do this, bees pick a spot within range of the flowers to move to.
 - They slow down as they approach the spot.
 - If the bee comes within 20 units of a flower whilst it is exploring, it will head towards the flower in order to load up with pollen
 - When the bee arrives at a flower, it will gather pollen from the flower at a rate of 1 unit per second until the pollen is all gathered. When the flower has no more pollen, it gets removed from the scene and the bee heads back to the hive to deposit the pollen.
 - If a bee does not find any flowers, it will pick a new spot to approach.
 - The bees AI updates 5 times a second.

Marking Scheme:

Description	Marks
Creating new bees from the hive as described above	20
Bee movement	25
Bee resource gathering	35
Polish & flair	20

Marks will be awarded for creative, modular, efficient and reusable solutions that adhere to Unity idioms and coding practices.