

School of Computing Science and Engineering

Course Code : CSGG4022

Course Name: Programming for Graphics and Gaming

UNIT I

**Introduction for Graphics and
Gaming**

**Introduction to Unity3D With
Examples**

Name of the Faculty: Mr. V. Arul

Program Name: B-Tech., - GG

Installation

- Download at <https://store.unity.com/>
- Free for students and company < \$100,000/y
- Supporting multi-platforms.



Program: B-Tech., GG

Getting started with a simple Unity3D project

- Start Unity3D
- New Project (3D or 2D)
- File->Save Scene

The logo of Galgotias University is a stylized 'G' composed of three curved, overlapping bands in shades of yellow, blue, and red. Below the logo, the text 'GALGOTIAS UNIVERSITY' is displayed in a serif font, with 'GALGOTIAS' in a larger, reddish-brown font and 'UNIVERSITY' in a smaller, grey font.

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Program: B-Tech., GG

Font size too small?

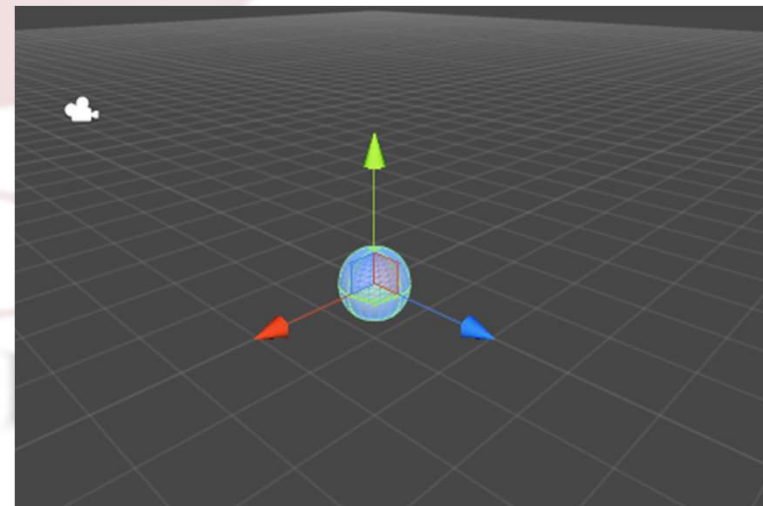
1. Right-click on the desktop
 2. Select “Display settings”
 3. “Change the size of text”
 4. Default to 125%, change to 175%
- for Unity IDE presentations

Getting started with a simple Unity3D project

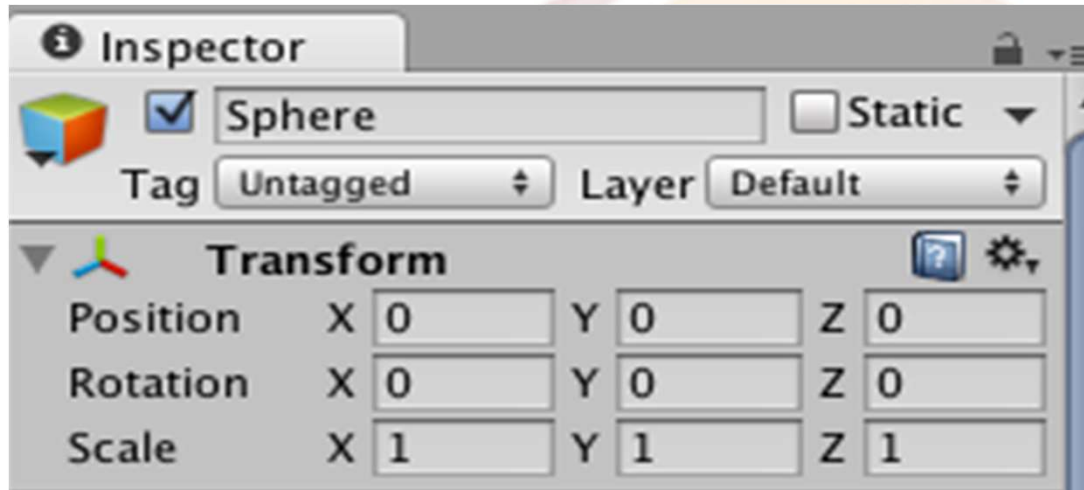
- Assets->Import Packages
 - Characters
 - Particle Systems
 - Vehicles
- Select components before importing each package.

Object Creation

- GameObject->3D object->Sphere
- Edit->Frame Select (to show the created object)
- Hold onto the arrows to move the sphere or change the position in the Inspector.
- Note: Y is up.



- Inspector and transform panel



- Moving, translation, rotation and scaling tools



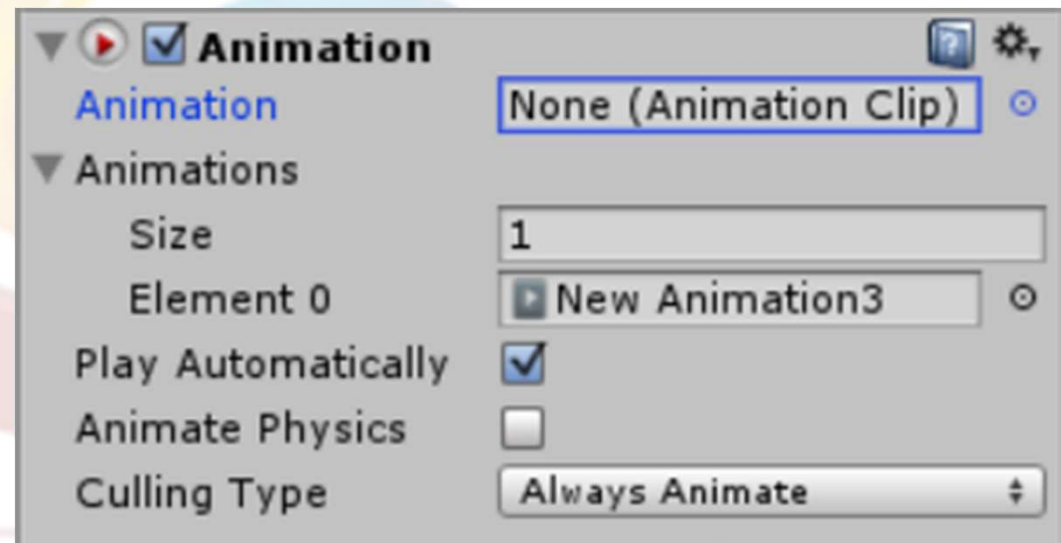
Unity 3D: Component

Select Created Game Object->Component->Physics->Rigidbody

- **Rigid Objects: non-deformable with physical properties (gravity, inertial).**
- **Non-rigid Objects:**
 - **Deformable: changeable geometry**
 - **Breakable: changeable topology.**
- **Intangible Objects: No predefined shape.**
fire, clouds, ...

Animation

- Window->Animation
- Click on the object to be animated.
- Component->Miscellaneous->Animation



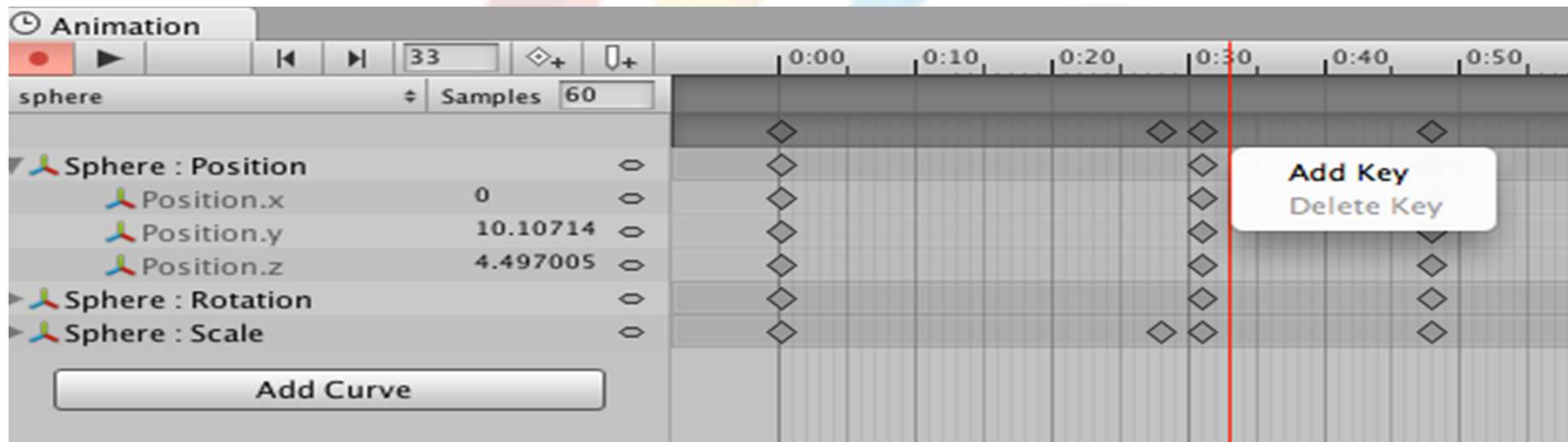
Animation

- Create New Animation Clip
- Click on the record button (red) at the top-left.
- Save the new animation clip file.
- Click on Curves.
- Select Add Property->transform → position, rotation or scaling

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Animation

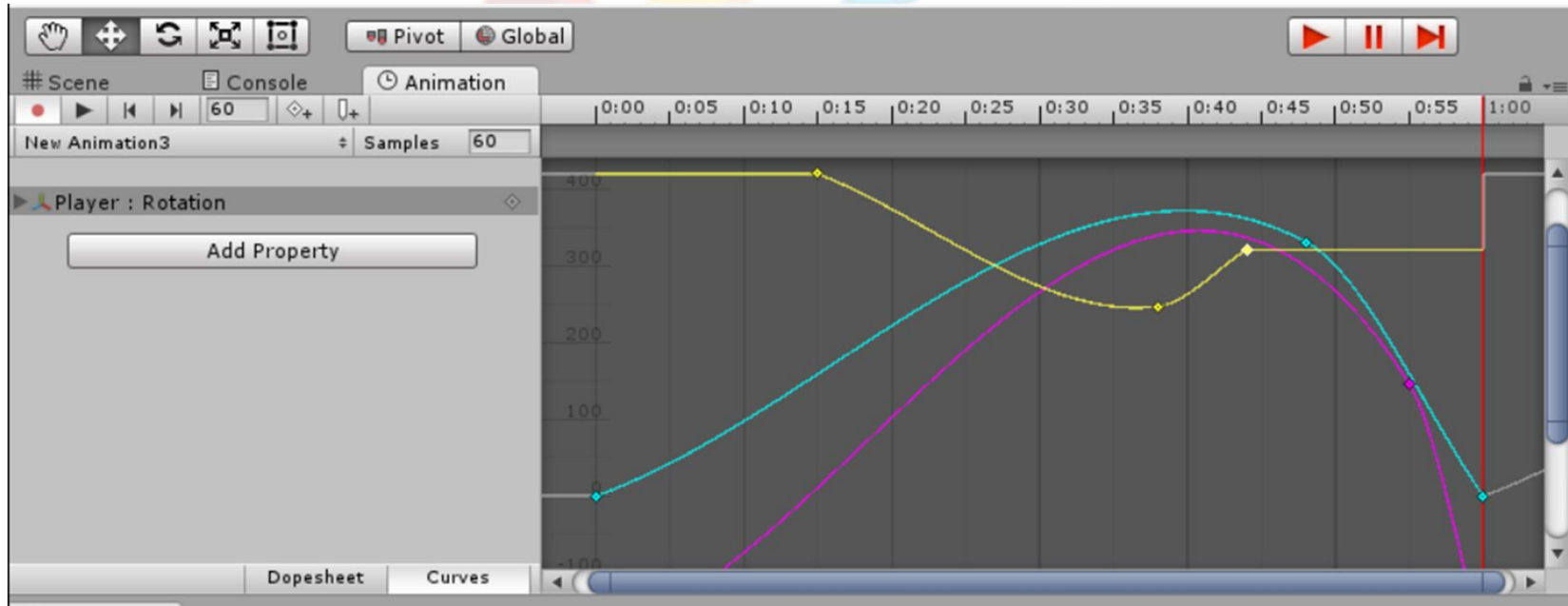
- Add key frame on the timeline as many as you want.



- Click on the red button again to finish making the animation clip.

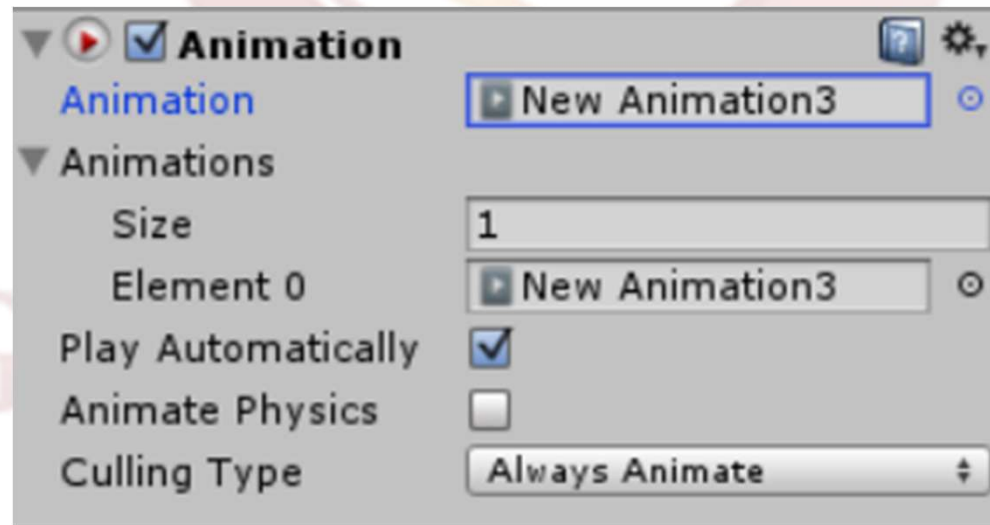
Animation

- Add key frame on the timeline as many as you want.



Animation

- Go back to Unity window.
- Under Inspector → Animation , change the name of animation clip from none to the one that you have made.



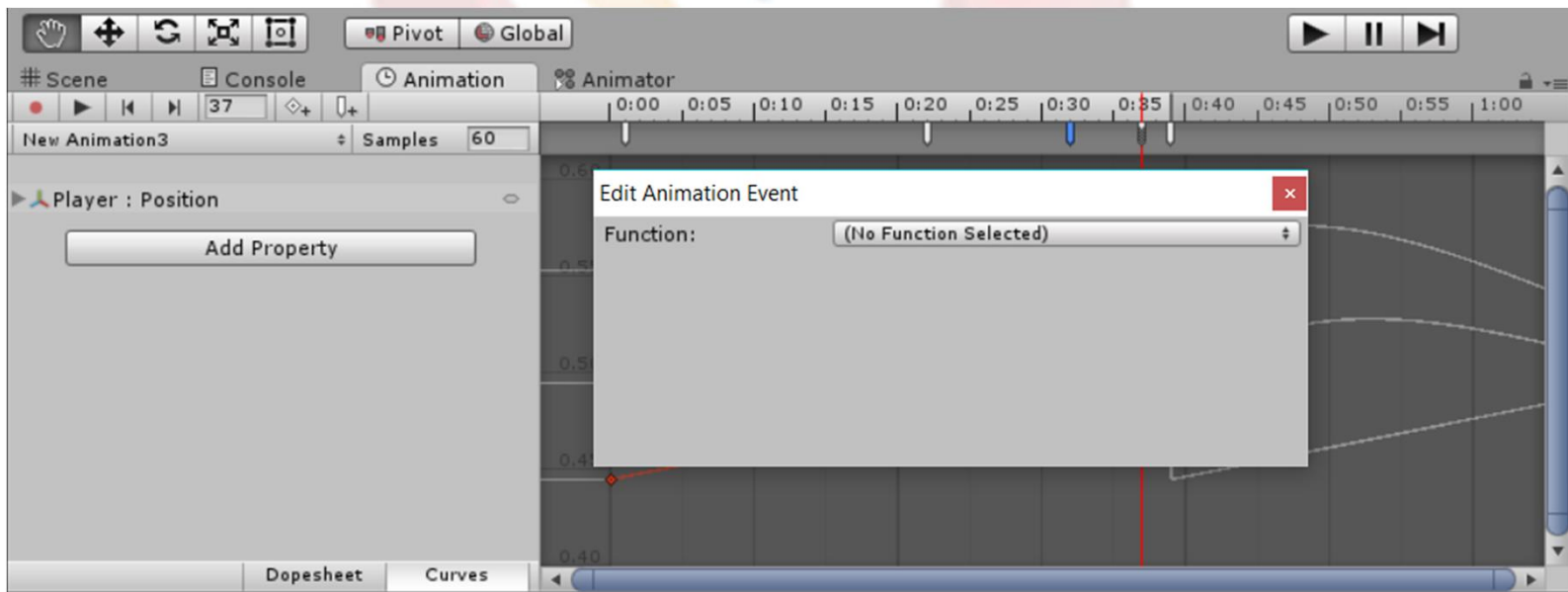
Animation Event

- Allows you to call functions in the object's script at specified points in the timeline.
- Add a new Animation Event by double-clicking the Event Line or by using the Event button.

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Animation Event

- When you add an event, a dialog box will appear to prompt you for the name of the function and the value of the parameter you want to pass to it.



Unity 3D: Light

- **Game Object ->Light -> Directional Light (Default)**
- **Move and rotate just like any other object.**



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Terrain

- GameObject → 3D Object → Terrain
- In the hierarchy panel, select Terrain.
- In the Inspector: set $x = -5$, $y = 0$, $z = -5$.
- Click on one of the action icons in Terrain (Script) to raise/lower terrain, paint height, smooth height, paint texture, place trees, paint details, terrain setting. Adjust brush size to 1 before performing the operations.
- Paint Texture: Edit Texture -> Select

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Terrain

- To place trees, you have to build tree first (Game Object->3D object ->Tree), then choose “Edit Trees -> Add Trees” first to add different types of trees.
- In the Add Trees popup window, you need click on the little circle at the right-most of the “Tree” row.
- Select, say, Palm and then click on “Add” in the “Add Tree” window.
- Go back to the Inspector, select “Mass Place Trees” from available “Trees” to add.

Physics

- Unity3D provide Physics library.
 - Rigidbody, collider, joint, force and etc.
- Rigidbody component : gravity automatically added
- Collision detection : box, sphere, capsule , mesh, whelle and terrain.
- Collision call back function : OnCollisionEnter, OnCollision and OnCollisionExit.

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Player (for a third-person game)

- Make sure to save the scene “File->Save Scene” (Ctrl S”) and save the project
“File->Save Project”
- Next, we need add the player.
- In the Project window, drag “Standard Assets->Character Controllers->3rd Person Controller” to the Hierarchy window.
- In the Hierarchy window, double-click on the 3rd Person Controller.
- Click on the “Move selected object” icon. Then move the controller to the top of the terrain. You may have to adjust your view angle by clicking on the ‘xyz’ icon to see the position. Click the middle of the icon to get the perspective view.

References

- <http://www.turbosquid.com>
- <http://www.autodesk.com/products/autodesk-maya/overview>
- <http://www.blender.org>
- <https://unity3d.com/>

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Thank You