# VR classes program

1. Build a basic home

In this lesson, students are learning basic functions of the Unreal Engine 4 for environmental modeling. It uses basic geometric shapes to create a simple house such as a Box Brush. Later in the course, the student uses furniture available in Starter Content to design the interior of the house. In the final phase of the course, the student adds lighting to the project using Point Light and all the necessary elements to make the project visible on VR.


2. Bowling alley

In the second lesson, students use the previously learned functions to create a new environment (bowling alley). After completing the creation of a bowling alley, students learn ways to import elements created in other 3D modeling programs (Autodesk Fusion 360). After importing items (bowling pins), the trainee learns the methods of assigning physics to elements, assigning collision zones and creating programs that allow items to be lifted.
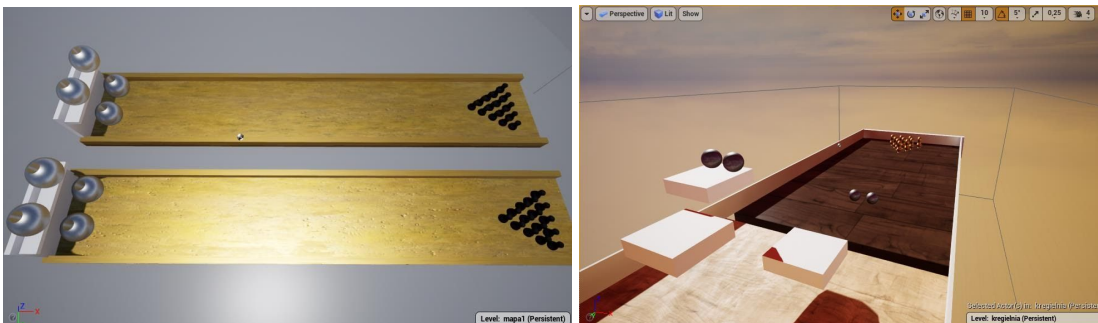

3. Basketball

During the third lesson, based on the acquired knowledge, students build a basketball court, import a basket model and create a ball that can be lifted.
The next thing is to create a Text Render display that shows the number of hits to the basket. After adding the display, students simply create a branch based logic program to count hits.
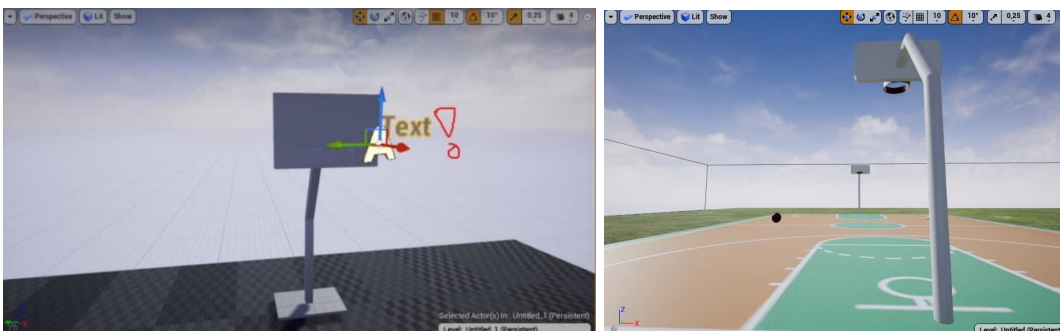
4.Materials

During these classes, students create their own materials, which they can then freely transfer to any object in his project. In the initial phase, students get to know the interface for creating new materials. Learn to use basic parameters such as Metallic, Base Color. In the next part, they learn about methods of creating materials using ready-made textures, at the same time he learns the basic colors of the Unreal Engine 4 environment and their applications. During the whole class, the student creates about 6 of his own materials.
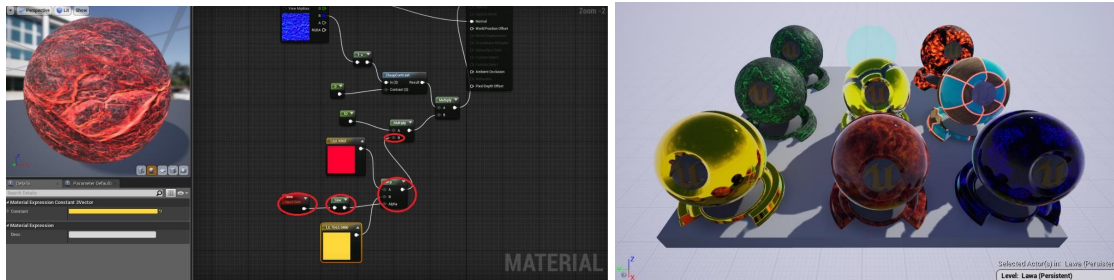

5.Landscape

In the fifth session, participants learn a new, more advanced method of creating an environment. Learn to use the Landscape option. In the first part, students create any surroundings with the help of tools for creating mountains and other elements of the world. During the second part of the class, students learn the height map and use it to design the environment, then, using the knowledge from previous classes, create a material appropriate to the environment. The last point of the course is to create an imitation of water, fog and setting sun, which results in a world that resembles reality.

6. Physical Materials and Procedural Mesh

The sixth class is devoted to learning how to create physical materials and learning about the Procedural Mesh component. The course participants learn about the parameters and create any physical materials (e.g. perfectly elastic) and observe the influence they have on the project they have created. Later in the class, students create an element that can be cut using the Procedural Mesh component. They learn to choose the appropriate physical properties of such elements and programs them so that they can be cut. Finally, they create objects (e.g. a sword) and program it to cut through previously created elements.
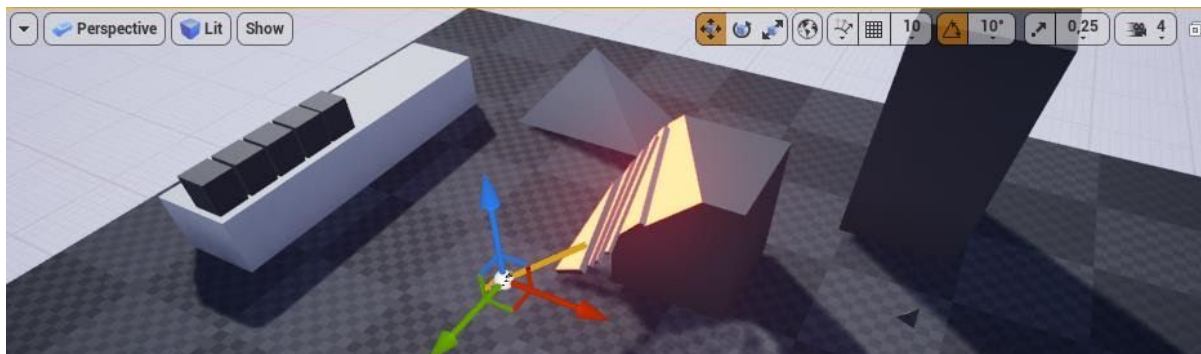

7.Destructible Mesh and Radial Force

During these classes students learn to create force, and break down objects into smaller elements in a designed way. The students learn a new interface - Destructible Mesh and learn its basic parameters to create disintegrating elements. In the next part, students learn about the use of the Radial Force component to observe the effects of work. Than they can use it in any way. During the final effect, students observe how the forces act on the elements that may disintegrate.
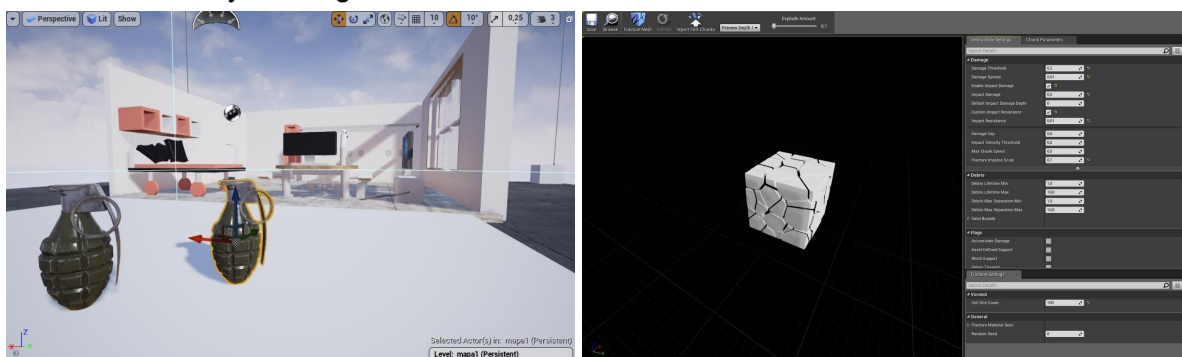

8. The shooter

During the eighth class, the course participants create weapons. The first step is to create the environment in the shape of a shooting range, to do this the student uses any previously known methods, and may even make elements that fall apart from class 7. Another thing is to import the gun model, design the cartridge model using the Projectile Movement component and connect it by programming the pistol with the cartridge so that the player can shoot freely using the buttons on the VR controller.
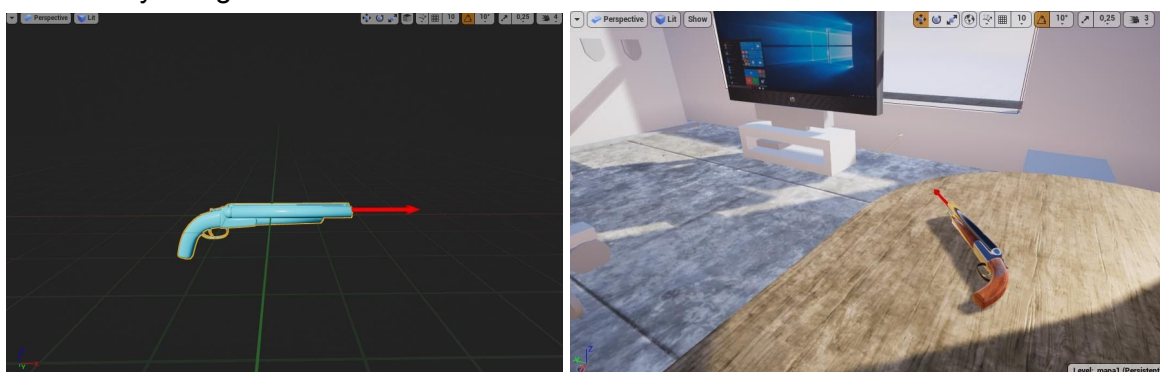
9.10. Creating game like "Beat Saber"

The ninth and tenth classes are devoted to building your first own game.

Students start with building a board on which the game will take place. Imports all the necessary elements for the game to function. Students use the learned programming techniques to create the basic logic of the game.They learn to create simple algorithms that allow you to build a fully interactive game with an increasing level of difficulty.
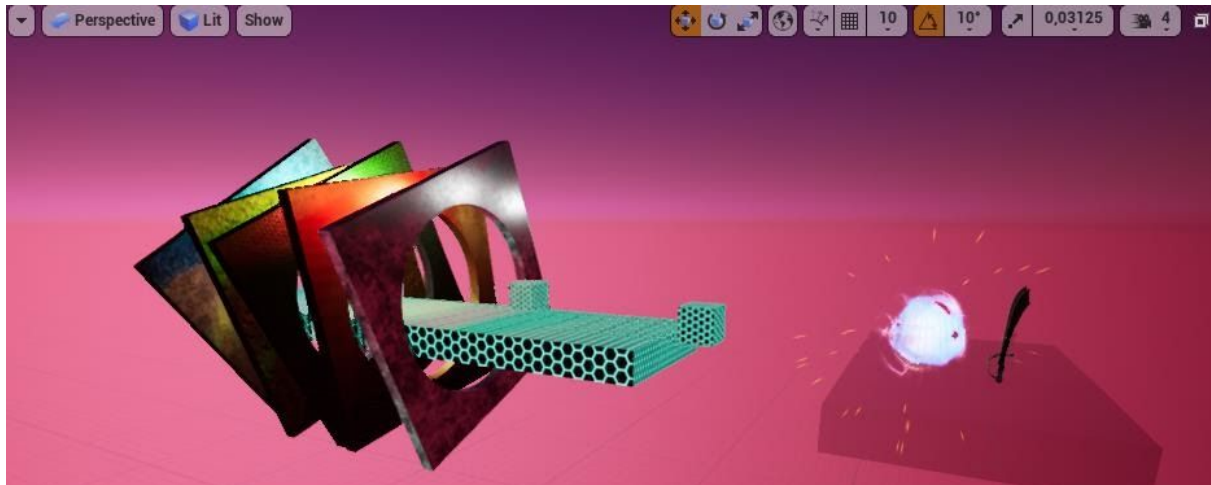
11. Create AI

In the eleventh class, students use a ready-made character model existing in Unreal Engine 4. Students learn the methods of animating the elements of the world, adjusting the parameters of moving around the map to the speed of the animation.

The main goal of these classes is to create simple artificial intelligence. The course participants get to know the AI creation interface. Build a simple algorithm that allows the characters to follow the player during the game. The character follows the player regardless of how he moves and where the player is.
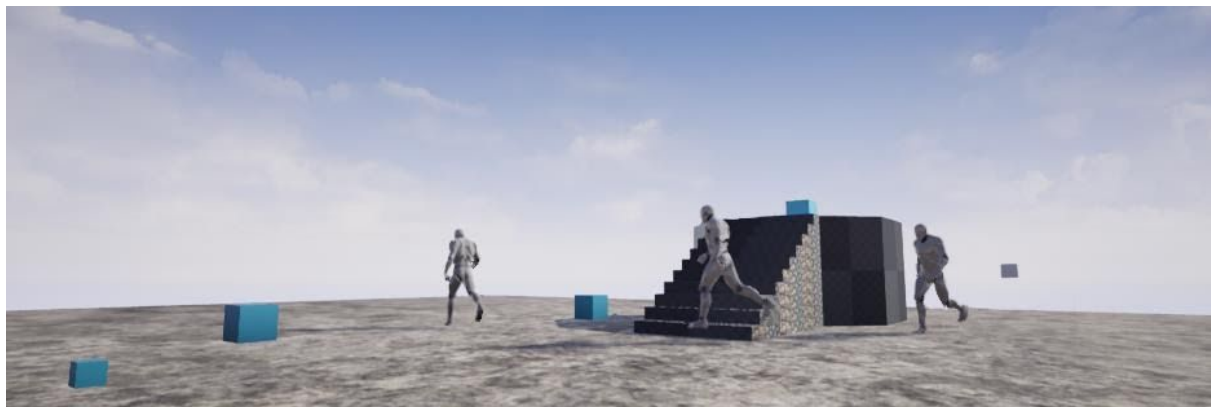
12,13,14 Building your own VR game

The last three classes are entirely devoted to creating your own simple VR game. Each student can create any worlds they want based on what they have learned from the beginning of the course. When creating the game logic, students try to use the algorithms they created earlier. During these classes, participants have at their disposal folders with ready-made models of the environment and furniture. By the end of the 13th class, students will learn the visual effects interface. Throughout the course of the class, the tutor helps and suggests various solutions to improve and streamline the game.