**ADVANCED GAME DESIGN:**

**Game Development with this Unreal Engine 4 Course for students who have completed INTRODUCTION TO GAME DESIGN**

The course will cover the following topics in detail:

* Projects & Levels
* Actor Types
* Meshes & Brushes
* Lighting
* Materials
* Characters & Input
* Collisions
* Blueprint Logic & Data
* User Interfaces
* Audio

**Unreal Engine 4 Advanced Video Game Design Course**

In this course, you will continue to learn the fundamentals of game development using the Unreal Engine 4 as well as Blender, Mixamo, and an introduction to Maya 3ds.

The course will start with a “refresher” form the Intro to Game Design Course. Game design takes many hours, the Advanced Course provides students with an opportunity to expand on their existing games (from Intro to game Design) as well as using “advanced” techniques and tutorials to take their games further.

The first part of the course will help you get the Unreal Engine 4 up and running and will introduce you to the basic concepts of game development using the Engine. You will also learn all the skills you need to craft beautiful environments to stage your games in. Then, you will learn how to script logic for your games so you can define game rules and behaviors, keep track of data such as health and inventory, and create playable characters. You will learn about collisions and damage, key concepts for any action game. You will learn how to create user interfaces using the UMG Editor, so you can add things like menus, load screens, and HUDs to your game. And finally, you will learn how audio works within the Engine so you can add music, dialogue, and sound effects to your game.

Upon completion of the course, you will have the skills necessary to translate *ideas* for games into playable games that use environments you sculpt and logic that you define, and you will understand how to make a game in Unreal Engine 4.

**What you’ll learn**

* Learn game development using version 4.19.2 of Unreal Engine 4
* Build realistic looking environments for games to take place in
* Define custom inputs and movements to control characters
* Script logic to define gameplay without needing to know how to code

**Are there any course requirements or prerequisites?**

* Introduction to Game Design
* ONE existing game (on USB) from the Intro course

**Who this course is for:**

* This video game development course is for absolute beginners who are interested in making games & learning how to design a game from scratch using UE4
* No programming experience required

## Lesson Descriptions

### [**Game Theory - Analog**](https://vfs.edu/programs/game-design/curriculum#collapse0)

Students are exposed to the fundamentals of game theory; unpacking the principles that make games, such as chess, dice, and cards, popular across centuries and cultures. Building on this base, students analyze contemporary non-digital games and discuss the risk/reward, captured through von Neumann’s minimax theory.

### [**Game Production**](https://vfs.edu/programs/game-design/curriculum#collapse2)

This course provides an introductory overview of the Game Industry and the development process, including the principles of Project Management. It gives students a better understanding of the different roles inside a development team, and the different phases of development of game projects.

### [**Storytelling**](https://vfs.edu/programs/game-design/curriculum#collapse3)

Contemporary entertainment franchises are not limited by the storytelling constraints of one medium. This course examines how different media can be used as part of a unified story strategy that leverages the strengths of each, while capitalizing on the potential of the whole.

### [**Level Design 1**](https://vfs.edu/programs/game-design/curriculum#collapse4)

This course introduces the process of designing a level on paper and quickly iterating on designs. A major element of this course is to explore the connections between game design and level design, especially how players interact in different game types. Students learn about planning for technical limitations, as well as unexpected player interactions. The final level designs are brought into a commercial engine to further understand how the level will be seen from the player's perspective.

### [**Programming 1**](https://vfs.edu/programs/game-design/curriculum#collapse5)

This course begins with the fundamentals of basic programming using Unreal 4.19.2

### [**Game Art 1**](https://vfs.edu/programs/game-design/curriculum#collapse6)

Students explore the fundamentals of 2D and 3D asset creation in Maya and Photoshop, the dominant industry standard software. They learn and apply fundamental principles behind all 2D image and 3D polygon graphics, regardless of platform, game engine, or creative software. Students make several game-ready assets using the core Photoshop and Maya toolsets used in game art creation and develop a strong overview of the game art creative process.

### [**Game Theory - Digital**](https://vfs.edu/programs/game-design/curriculum#collapse7)

Building on the work of Game Theory (Analog), this course seeks to apply the essentials of game theory to the success of various popular video games. Students undertake rigorous analysis of historic videogames, from the arcades to modern day game systems.

### [**Game Mechanics**](https://vfs.edu/programs/game-design/curriculum#collapse8)

Game Mechanics are the building blocks that make up game-play. Students look at the various aspects of game mechanics; what they are, how they can be formed, how they interact with each other, and various topics relating to the application of game mechanics.

### [**Team Management**](https://vfs.edu/programs/game-design/curriculum#collapse9)

This course provides game designers with an understanding of how teams come together, and what keeps them performing at the level necessary to build A-quality titles. It also covers the key leadership skills fundamental to facilitating a high performing team.

### [**Critical Analysis**](https://vfs.edu/programs/game-design/curriculum#collapse10)

Critical Analysis is a core part of the design process. Evaluating a game, and all its components, allows designers to determine areas of strength, weakness, and opportunities for improvement or new game elements. This creates a game designer that has better analysis skills, and potentially a new career track in the Video Game Review field.

### [**Level Design 2**](https://vfs.edu/programs/game-design/curriculum#collapse11)

As a level designer in the game industry you can determine exactly what the player sees, hears and feels in the game. In this three-term course students learn the common procedures for building a level for their games. Students cover creating paper designs of levels, and how to translate those ideas into objects and architecture, placing units and scripting their behavior.

### [**Game Art 2**](https://vfs.edu/programs/game-design/curriculum#collapse13)

In Game Art 2, students take a deeper look into the tools and techniques used to create sprites, such as Angry Birds, how to animate them and how to incorporate them into the growing field of 2.5D games. We continue our work into creating game ready 3D models, creating efficient UV mapping co-ordinates, while using Photoshop to create detailed colour, specular, ambient and normal texture maps that we can apply to these models. We conclude this course with an introduction to simple skeletal rigs and use them to animate models.

### [**Mobile/Social Design**](https://vfs.edu/programs/game-design/curriculum#collapse14)

Mobile gaming is a fast-rising sector of the game design industry. Porting a game from rich platforms to mobile devices has proven risky, yet the adaptation of simple “time wasters” strikes a chord with mass audiences. This course explores the unique niche occupied by wireless and handheld game devices such as iPad games and tries to define the requirements for a successful title. Working under the mentorship of the course instructor, students design a wireless game concept.

### [**Game Interface Design**](https://vfs.edu/programs/game-design/curriculum#collapse15)

Students begin to adapt their design sensibility to the requirements of game information systems. In addition to constraints imposed by platform selection, students consider optimal ways to engage players through an adaptation of real estate to the dictates of title/genre. Essential treatments of way-finding, intuition and color palette are applied to concepts ranging from HUDs to game initiation screens.

### [**Creative Writing**](https://vfs.edu/programs/game-design/curriculum#collapse16)

Building on the fundamental theories of story structure, students are given a structured series of exercises that allows them to develop the essential building blocks of their story. Classes focus on dramatic arc, conflict, character vs. characterization, backstory and dialogue.

### [**Level Design 3**](https://vfs.edu/programs/game-design/curriculum#collapse17)

Students study more advanced topics in level design, building on the content covered in Level Design 1-2. By the end of the term, students have demonstrated advanced topics on how to create an interactive environment for their video games and, more importantly, how to make their levels fun.

### [**Mission Design**](https://vfs.edu/programs/game-design/curriculum#collapse18)

To create goals that are oriented to support the gameplay theme—while achieving a high standard of what makes an mission fun, purposeful and exciting—students learn the fundamentals of what a mission is, why they are relevant, and how missions are delivered. Throughout the course students analyze, interpret, reorganize, and create missions for various levels.

### [**Programming 2**](https://vfs.edu/programs/game-design/curriculum#collapse19)

Advanced system programming and techniques are explored using the C++ Programming Language, as well as advanced topics pertinent to game development, including linear algebra math. Students learn the software technologies and techniques underlying both 2D and 3D games.

### [**3D Modelling 1**](https://vfs.edu/programs/game-design/curriculum#collapse20)

This introductory course focuses on the modelling and texturing skills required to build simple environments. Using Maya students begin by modelling simple objects. After practicing these techniques they move on to design and build an environment.

### [**Portfolio Project**](https://vfs.edu/programs/game-design/curriculum#collapse22)

Students create an original game in a team-based environment. Student use the Unity game engine realize their vision. Students gain valuable game development experience through overcoming team conflicts, meeting milestones and submitting major deliverables. The course concludes with a final presentation of the game to the entire Game Design student body and staff.

### [**Online/Multiplayer Design**](https://vfs.edu/programs/game-design/curriculum#collapse24)

Playing games in an online world, and competing against players in Multiplayer or Massively Multiplayer Online (MMO) gaming environments, changes the rules for how games should be designed to provide the best play experience for all parties involved and requires additional design constraints and considerations. This course focuses on those design choices.

### [**Project Management**](https://vfs.edu/programs/game-design/curriculum#collapse25)

This course explores a number of management models and discusses their application to various situations likely to be encountered in the game industry.

### [**Level Design 4**](https://vfs.edu/programs/game-design/curriculum#collapse29)

Students learn the value of modular and procedural level design techniques to enhance gameplay and reduce production costs. Students also learn about the different considerations for specific subsets of level design, such as cover combat layouts, race track designs, and puzzle game levels. During this time students utilize industry best practices to build these levels, and discover their own approach to building game levels. By the end of the term, students have practical experience following best practices and processes for designing and constructing levels for different genres of games. This knowledge will be directly applicable to their industry projects and portfolios.

### [**3D Modelling 2**](https://vfs.edu/programs/game-design/curriculum#collapse31)

Strong 3D characters and character animations are keys parts of modern games. Games like God of War or Call of Duty have well defined characters that are central for users to see and control. In 3D Modelling 2 we investigate what makes for a great game character’s design.

### [**Environment + Lighting**](https://vfs.edu/programs/game-design/curriculum#collapse32)

With game levels using ever larger environments, good quality set dressing and detailed immersive lighting is needed to enhance the game experience. In this course students learn how to quickly prototype an environmental model, create vertex lighting and ambient occlusion texture maps for game levels.

### [**Animations and Shaders**](https://vfs.edu/programs/game-design/curriculum#collapse33)

Animation, Materials and Shaders focuses on giving the students the necessary skills and knowledge required to effectively deliver visually engaging game products that would be at home in today’s evolving industry. The class alternates focus on rigging and animation, and shader techniques used in games today.

### [**Quality Assurance for Games**](https://vfs.edu/programs/game-design/curriculum#collapse35)

Springing from the work undertaken in Game Mechanics, this course exposes students to the fundamental methodologies employed by game developers to identify and correct game mechanic failures. In addition to game tuning considerations, students are also given hands-on practice with an asset management system.

### [**Business of Games**](https://vfs.edu/programs/game-design/curriculum#collapse36)

The development of games is not only about creativity, technical, and artistic elements; it also has diverse business aspects. This course provides students with a grounding in the three key areas of business associated with game development. The course consists of three separate sessions: Legal Wrangling; Dollars and Sense; and Marketing Savvy.

### [**Cinematics**](https://vfs.edu/programs/game-design/curriculum#collapse37)

This hands-on course introduces game designers to the tools and techniques of film production. In addition to pre-production basics, the course provides a comprehensive overview of camera operation, sound and lighting techniques, as well as the storyboarding process. Each student writes a cinematic treatment and create a storyboard for a film trailer.