3D game modeling in Blender. Module 1

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one   **Getting Started with Blender 3D Modeling Environment**

- Introduction to the software interface.
- Learn about basic objects such as cubes, cylinders, planes, etc.
- Study the fundamental tools for moving, rotating, and resizing objects.
- Understand the components of an object: vertices, edges, faces.

Practical task: Using simple objects and basic tools, create a complex, composite object.
Learning outcome: got your first experience with the world of 3D modeling and its tools.

Day two   **Introduction to Blender Model Editing Tools**

- Extrude - extrusion new components to the model.
- Insert Faces - creates a surface within a surface.
- Bevel - rounds off sharp edges.
- Knife - cuts the model into various shapes.
- Loop cut - cuts the model in a circular fashion.

Practical task: Using these tools, turn any simple object into a more complex sculpture without incorporating additional objects.
Learning outcome: developed spatial reasoning skills.

Day three   **Blender Model Editing Tools. Part 1**

- Poly Build - a multifunctional tool for quick editing.
- Spin - fast creation of new polygons through rotation.
- Smooth - smoothing surfaces and transitions between them.
- Edge slide - displacement along the edge.

Practical task: Using the learned tools, create a high-quality model from a single vertex.
Learning outcome: Enhanced set of tools for shaping the model and imagination development.

Day four   **Blender Model Editing Tools. Part 2**

- Shrink/Fatten – moves surfaces along normals.
- Push/Pull – moves surfaces from the center point.
- Rip Region – creates new regions.
- Annotate – adding notes during modeling.
- Summary of Edit Mode topic.

Practical task: Use the Edit mode tools to create a realistic model of your favorite animal.
Learning outcome: Reinforce skills gained while working with the classic Edit mode of the model.

3D game modeling in Blender. Module 2

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one   **Introduction to Materials**

• First acquaintance with simple materials.
• Analysis of material tabs.
• Various types of base materials.
• Rough, smooth and luminous surfaces.

Practical task: creating your own materials and their customization, applying the same materials to different objects.
Learning outcome: got to know materials and their influence on the appearance of the model.

Day two   **Using Different Materials on the Same Model**

• Creating multiple slots for materials.
• Distribution of materials.
• Applying materials to polygons.
• Principle BSDF material and its settings.

Practical task: create several materials for one model and apply them to different parts of the model.
Learning outcome: developed an understanding of the interaction of materials and their distribution according to the model.

Day three   **Working with Textures**

• The concepts of "texturing" and "texture".
• Search and use of ready-made textures.
• Seamless textures and tiling.
• UV-mapping and correct distribution of texture across polygons.
• Texture Paint – creating your own textures.

Practical task: create a model with one or more textures and distribute them correctly.
Learning outcome: expanded the set of tools for model formation and development of fantasy.

Day four   **Creating Materials Using Nodes**

• The concept of "nodes" and their mutual influence on the material.
• Basic nodes.
• Extended node types.
• Mixing nodes.

Practical task: using nodes, make the following materials: like silver, gold, marble, glass, chocolate.
Learning outcome: learned how to create complex and realistic materials to obtain a better appearance of the 3D model.

3D game modeling in Blender. Module 3

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one   **Introduction to Animation**

• Timeline and working with it.
• Key frames and their creation.
• Animations of movement, rotation, resizing.
• Visibility animations on the render.

Practical task: make animations of moving three different objects so that they look interconnected.
Learning outcome: obtained the first skills in object animation.

Day two   **Animated Parameter Items Review**

• Animation of color and material.
• Camera animation.
• Light source animation.
• Animation curves.

Practical task: use light color and visibility animations to simulate a light bulb flickering and overheating.
Learning outcome: formed of a non-standard approach and use of animations and their capabilities.

Day three   **Making video clip**

• Working on a video idea.
• Setting the scene.
• Determining camera angles and accents.
• Configuring output file parameters.

Practical task: make a short video using animations, preparing the scene and thinking through the plot.
Learning outcome: developed skills in creating cut scenes for games.

Day four   **Creating special effects**

• The concept of modifiers.
• Build modifier.
• Options for using the Build modifier in a project.
• Application of animations in the real world.

Practical task: make an animated opening for a Youtube channel.
Learning outcome: learned to use animation skills to a real task.

3D game modeling in Blender. Module 4

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one

Modifiers. Understanding Their Purpose and Effective Use. Part 1

• Introduction to modifiers and their purpose.
• Mirror – mirror modeling.
• Array – multiple cloning.
• Subdivision surface – increasing the number of polygons and smoothing.

Practical task: make a model using all three types of modifiers.
Learning outcome: understood how modifiers work, increased modeling speed thanks to their use.

Day two

Modifiers. Understanding Their Purpose and Effective Use. Part 2

• Bevel – smoothing corners.
• Decimal – reducing the number of polygons.
• Wireframe – creation of a 3D mesh along the edges of the model.

Practical task: make a model using three new types of modifiers.
Learning outcome: expanded set of tools for fast modeling.

Day three

Modifiers. Understanding Their Purpose and Effective Use. Part 3

• Screw – creating objects by twisting.
• Smooth – smoothing transitions.
• Curve – work with curves and combinations with other modifiers.
• Hook – surface modification using additional objects.

Practical task: create a model using Screw, add to it details using Curve + Array.
Learning outcome: trained the skill of quickly creating objects from curves modifiers.

Day four

Modifiers. Understanding Their Purpose and Effective Use. Part 4

• Wave – creating a "Wave" type curvature.
• Warp – deformation by stretching.
• Boolean – getting a new object from the previous two.
• Remesh – re-creation of a mesh of objects.

Practical task: make a piece of cheese using the learned modifiers.
Learning outcome: improved skills in working with object deformation by application of modifiers.

CODDY

3D game modeling in Blender. Module 5

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one

Introduction to Lighting

• Types of light sources and a brief introduction to them.
• Point light.
• Sun light.
• Spot light.
• Area light.

Practical task: create a model suitable as a source for each type of lighting.
Learning outcome: gained first skills in working with different light sources.

Day two

Material as a light source

• Using Emission material as a light source.
• Combination of Emission material and light source.
• Different surfaces have different glow.
• Light distortion for glass materials.

Practical task: make a model of a lamp that glows in one color, but illuminating the surrounding surfaces with a different color.
Learning outcome: made experiments with an unusual combination of color and light.

Day three

Detailed analysis of lighting settings

• Light section.
• Shadow section.
• Spot Shape (for Spot Light).
• Custom Distance subsection .

Practical task: combine light with animation and create different effects.
Learning outcome: gained knowledge of light and its influence on game objects.

Day four

Light Tricks

• Shadow length.
• Light source overload.
• Using colors when using light.
• Using textures on the light source.

Practical task: create a scene using the lighting tricks you've learned.
Learning outcome: gained additional skills and a non-standard approach to lighting.

3D game modeling in Blender. Module 6

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one   **Introduction to sculpting**

• Introduction to new tools.
• Using Draw, Draw Sharp brushes.
• Clay, Clay strips, Clay thumb.
• Layer.

Practical task: make your first model in sculpting mode.
Learning outcome: created a model in a new way of modeling and using new tools.

Day two   **We continue our acquaintance with sculpting**

• Inflate, Blob, Crease.
• Smooth, Flatten, Fill.
• Scrape, Multiplane scrape.
• Pinch, Grab.

Practical task: make a model using sculpting with a lot of details.
Learning outcome: obtained a highly detailed model in sculpting mode.

Day three   **Let's dive further into sculpting**

• Elastic Deform, Snake Hook, Thumb.
• Pose, Nudge, Rotate.
• Slide Relax, Boundary, Cloth.
• Simplify.

Practical task: creating characters models with a high level of detail.
Learning outcome: created high-quality models using sculpting for further use in games.

Day four   **Converting the sculpting model to low-poly one**

• The concept of retopology.
• Different ways to create a low-poly model.
• Studying ready-made models to learn more about sculpting details.
• Refinement of ready-made models to obtain higher quality result.

Practical task: create a low-poly character model for a mobile game from model created earlier by the sculpting modeling method.
Learning outcome: gaining skills in converting high-polygon models to low poly ones.

3D game modeling in Blender. Module 7

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one　　**Rigging. Creating a skeleton**

• Bones and their connection to the model.
• Types of connections between bones.
• Ready-made skeletons for humanoid characters.
• Distribution of bones.

Practical task: create a skeleton for the character from previous lessons.
Learning outcome: created skeleton model for animation.

Day two　　**Skeletal animation. Weight Paint**

• Concept of weight and Weight Paint.
• Automatic Weight Paint.
• Extra bones.
• Generating Rig.

Practice: adjust the weight for the generated skeleton for one of your models.
Learning outcome: gained skill of setting up skeletal animation.

Day three　　**Character animations for games**

• Preparing the character model for animation.
• Fixing the starting position.
• Splitting Timeline into animation sequences.
• Configuring smooth animations using Graph Editor.

Practical task: create basic character animations Idle, Walk, Run, Jump.
Learning outcome: gained skill of character animation for the game.

Day four　　**Skeletal animation of game objects**

• Analysis of models that are suitable for skeletal animation.
• Modeling a snake and creating skeletal animation.
• Creating hero's cape skeletal animation.
• Summarizing the topic of skeletal animation.

Practical task: creating models of objects using rigging and skeletal animation.
Learning outcome: gained skill of creative application of skeletal animation to simple objects.

3D game modeling in Blender. Module 8

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one — **Introducing the particle system**

• Overview of the Emitter particle system.
• Overview of the Hair particle system.
• Basic settings for particle systems.
• Using an object for a particle system.

Practical task: creating a simple particle system.
Learning outcome: gaining basic skills in working with a particle system.

Day two — **Create various effects using the particle system. Part 1**

• Learning settings to create a rain effect.
• Creating a rain effect.
• Learning settings to create a snow effect.
• Creating a snow effect.

Practical task: creating the effect of a blizzard, rain and snow.
Learning outcome: honing your skills in working with particles.

Day three — **Create various effects using the particle system. Part 2**

• Learning settings to create fire and smoke effects.
• Creating fire and smoke effects.
• Learning the settings to create a sparkle effect.
• Creation of different types of sparks.

Practical task: creating a realistic campfire.
The Learning outcome: combining different particle systems to achieve a more realistic effect.

Day four — **Create Sci-Fi effects with the particle system**

• Various Sci-fi effects using a particle system.
• Energy effects.
• Liquid simulation effect.
• Summarizing work with particle systems.

Practical task: creating different effects by mixing systems of particles and deformation of objects.
Learning outcome: learned how to create effects for games using particle systems.

3D game modeling in Blender. Module 9

Learning goals: to get acquainted with the art of 3D modeling, to learn how to work in a 3D modeling program, with animations, effects, to develop your imagination and spatial thinking, acquire skills in working with three-dimensional objects.

Course Syllabus:

Day one   **Introduction to add-ons**

• Analysis of the concept of "add-ons".
• LoopTools.
• Import Images as Planes.
• Extra Objects.

Practical task: adding new objects, creating a complex model.
Learning outcome: understood the convenience of add-ons and gaining first skills in working with add-ons.

Day two   **The most common add-ons**

• Bolt Factory.
• Copy Attributes.
• Bool Tool.

Practical task: creating a complex mechanical model.
Learning outcome: strengthening speed modeling skills of gaming models.

Day three   **Children's portfolio creation. Preparing for the presentation**

• Analysis of the work done within the course.
• Selecting the most successful models, making adjustments.
• Create the right scene for each model.
• Preparation of portfolio presentation.

Practical task: make ready-made renders of your models to create your own portfolio.
Learning outcome: formation of a real 3D artist portfolio for everyone student.

Day four   **Portfolio presentation. Shaping the vector of further development as a 3D artist**

• Portfolio revision.
• Preparing for the presentation.
• Presentation of a 3D artist's portfolio.
• Formation of a vector for further development as a 3D artist.
• Summing up the course.

Practical task: demonstrate your work, created during the course in 3D game modeling.
Learning outcome: presentation of a real portfolio of a 3D artist.