CIRCUIT STREAM

ONLINE COURSE
10 WEEKS PART-TIME
circuitstream.com

VR/AR DEVELOPMENT WITH UNITY

COURSE SYLLABUS

COURSE OVERVIEW

In the 10-week Virtual and Augmented Reality Development with Unity course, you'll learn to create VR and AR apps using Unity, C#, and the industry standards for applications.

Course participants will build a personal VR or AR application for their portfolio or as a project for a client. Instructors are professionals working in the Virtual and Augmented Reality industry committed to helping you learn to build VR and AR apps.

WEEKLY OUTLINE

The course meets **three times per week for 10 weeks**:

1. Online Class (3 hours)
2. Personal VR or AR Project (1 hour)

In section 2, the course dedicates a separate focus on your own application. You will have a one-on-one session together with the instructors focused on solving specific problems and building your personal VR or AR app.

COURSE GOALS

By the end of the course, you'll be able to:

- Create your own VR or AR idea in Unity
- Design for different VR and AR platforms
- Manage production of VR and AR projects
- Effectively design applications around the benefits of VR and AR
- Collaborate on team Unity projects
- Connect to a powerful network in the VR and AR industry

PREP COURSE

Set yourself up for success with our guided Unity tutorials completed from anywhere at your own pace. The first step in creating virtual and augmented reality apps is laying the foundations in Unity and C#. The prep course will introduce basic features and get you comfortable with the tools you'll need throughout the course.

Ready to get started? Email **support@circuitstream.com** and we'll send you the list of introductory tutorials!

COURSE PREREQS

This is a beginner friendly course, no previous experience is required.

Students who have no programming experience will be guided with beginner coding resources. We will provide additional course preparation material to learn the fundamentals of programming and C#.

All students with programming experience will be provided additional resources to fit their level of expertise.

ABOUT US

Circuit Stream offers virtual and augmented reality education and training services for professionals and businesses. Established in 2015, we've trained over 20,000 students through workshops, 1:1 mentorship and small classes.

Our online VR/AR Development with Unity course is customized for professionals investing in their abilities and careers. Our team mentors students to build their idea into a working prototype in 10 weeks. Our course offers virtual and augmented reality training based on applicable real-word experience to give participants the skills, contacts, and confidence to kick start their virtual reality venture.

We're looking forward to seeing what you create!

WEEK ONE

INTRODUCTION TO UNITY

- Unity Overview:
  Windows, Interface, Navigation, Terminology, GameObjects, Hierarchy, Parenting Objects
- Asset Store, Importing Plug-ins
- Creating a Terrain, Materials, Colors, Transparency
- Introduction to Monobehaviors:
  Awake, Start, Update
- Overview of VR Devices and their Representation in Scene

WEEK ONE PROJECT

- Create a new Project
- Create a Scene within the new project
- Create 3D Objects within the Scene
- Ceate an environment for your VR/AR projects

WEEK TWO

INTRODUCTION TO SCRIPTING, AR, & PHYSICS

- Vuforia Overview:
  Interface, Navigation, Terminology, Image Targeting, Custom Images
- Overview of Physics in Unity
- Introduction to Scripting:
  Terminology, Creating Objects, Accessing Components, Debugging, Lists, Loops

WEEK TWO PROJECT

- Create custom image to track in Vuforia
- Attach scripts to objects in the scene
- Write scripts o have objects chase other objects

WEEK THREE

EXPANDING ON SCRIPTING & INTERACTIONS

- Creating Trigger Events
- Manipulating Components in Scripts
- Coding Simple AI
- Programming Interactions between Objects and Tracked Images
- Designing a simple User Interface in AR
- Navigating World Space for Objects and User

WEEK THREE PROJECT

- Create a canvas and a color palette
- Create unique uses for a User Interface
- Access values across other scripts to perform function

WEEK FOUR

VR HEADSETS AND OCCLUSION

- OpenVR Overview
- Creating Simulated User in VR
- Occlusion in VR and AR
- Expanding on Object Interactions

WEEK FOUR PROJECT

- Create a simulated hand for testing without a VR headset
- Design interactions between objects through physics & relationships

WEEK FIVE

INTERACTIONS

- Introduction to colliders and their use:
  OnCollisionEnter, OnCollisionExit, OnCollisionStay
- OnTrigger vs OnCollision
- Rigidbodies and how Colliders report to them

WEEK FIVE PROJECT

- Create a script that will modify GameObject when collided with:
  Shrink / Grow / Change Color
- Create a script that will modify GameObject when it is triggered:
  Shrink / Grow / Change Color
- Attach scripts to GameObjects in scene and test

WEEK SIX

DEEP DIVE INTO VR INTERACTIONS

- Controller Script: Getting Input from Devices
- Reviewing, Grabbing and Throwing Objects
- Interactable Components
- Discuss pros and cons of parenting interactable system:
  Joint-based, Physics-based, and more

WEEK SIX ACTIVITY

- Set a cube to pick up with grip button instead of trigger
- Create a new script that inherits from the interactable base class
  - When you are holding a GameObject and press the trigger button, make a visible change to the GameObject *(Shrink / Grow / Change Color)*

WEEK SEVEN

EVENT SYSTEMS

- Unity Events (for use with Inspector)
- Static Unity Events / Actions within scripts:
  Buttons, Dials, Levers, etc
- Events and Delegates (C#)

WEEK SEVEN ACTIVITY

- Create a script that fires an event when you pull the trigger and are touching the GameObject
- Create a musical instrument with volume control
- Build a cannon with aiming dials, lever to reload, and shoot with button

WEEKS EIGHT & NINE

RAYCASTING, TELEPORTING & AR PLANES

- What is Raycasting:
  Use in VR and AR, Interactions with Objects
- Controller Trackpad Functions:
  Deadzones, Trackpad Division
- Implementing Teleporting:
  Teleporting to Waypoints or Flat areas, Adjusting CameraRig
- Understanding of Planes in VR/AR
- Introduction to ARKit and ARCore

WEEKS EIGHT & NINE ACTIVITY

- Create AR Story experience:
  - Custom image tracking in AR
  - Record voice reading story, set audio to play when image shown
- Develop bubble-popping AR app
- Assign multiple actions with single Controller Trackpad

WEEK TEN

FINALIZING & PUBLISHING YOUR APP

- Introduction to Physics Materials:
  Bouncy, Slippery, etc
- Advanced Hinge Joints & the Pitfalls of Interactions via Parenting
- Publishing apps that Perform Consistently:
  90fps (Desktop), 60fps (Mobile)
- Help from instructors solving bugs and problems in your personal project
- Resources and Next Steps:
  Circuit Stream Slack Channel, Circuit Stream Blog, Recorded Courses, Additional 1:1 Training, Recommended Tutorials and Guides

WEEK TEN ACTIVITY

- Combine all your interaction systems into one interactive application
- Build your application

**This Syllabus is subject to change*

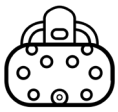
NEW TO CODING

Interested in learning how to code? The VR/AR Development with Unity course will introduce you to C# coding in an intuitive and visual way. Each week our instructors will help you understand the fundamentals of creating an interactive experience and by the end of the program you'll be creating your own VR or AR applications.

DEVELOPERS

If you have programming experience you're going to be diving into the code from Day 1. You'll begin building VR/AR apps quickly and meet a community of other developers. We'll focus on specific problems to solve and provide you with the pieces of C# that can help. Ultimately, you'll understand the structure of how C# works with Unity on a deep level.

PARTICIPANTS HAVE BUILT APPS FOR:



VIVE

CARDBOARD & DAYDREAM

OCULUS

GEAR VR

PSVR

MICROSOFT HOLOLENS

MAGIC LEAP

WINDOWS MIXED REALITY

iOS DEVICES

ANDROID DEVICES

SUPPORTED HEADSETS & TECHNOLOGY

While you do not need a headset for the course, we support every VR and AR headset and technology.

GOOGLE CARDBOARD
Supported

GOOGLE DAYDREAM
Supported

SAMSUNG GEARVR
Supported

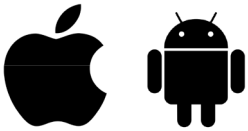
HTC VIVE
Supported

OCULUS RIFT
Supported

WINDOWS MIXED REALITY
Supported

MICROSOFT HOLOLENS
Supported

MAGIC LEAP ONE
Supported



MOBILE AR DEVICES
Supported

INDUSTRY MEMBERSHIP

Job searches for VR developers were up over 800% in 2016. We believe VR and AR technology is set to become the next computing platform. Hundreds of new consumer and business apps will become part of our work, play and everyday life. Our industry membership program helps students network with professionals and make the career transition to the industry.

UNITY AUTHORIZED TRAINING PARTNER

Circuit Stream and their instructors are certified by Unity to provide VR and AR training. Training partners are approved based on their expertise, focus on quality education, and commitment to providing the highest level of Unity training available.

OUR PARTNERS

unity

oculus

VIVE

VR/AR ASSOCIATION

Microsoft HoloLens

awe

ARCHIACT

VRLA

HOW TO ENROLL

Visit **circuitstream.com** for the start dates of the next course.

RESERVE YOUR SEAT

- Select your timezone (Eastern or Pacific)
- Place a $75 deposit to officially enroll

COURSE REQUIREMENTS

Mac or Windows. You do not need a VR or AR device for the course. Beginner friendly.

No previous experience is required.

COURSE PRICE

The course price is $2,500.

3 month, 6 month, and 12 month payment plans are available for as low as **$217 / month**.

Email us at **support@circuitstream.com** with the subject "Payment Plan" for more information.

CIRCUIT STREAM

GET IN TOUCH

1 (844) 858-2121

support@circuitstream.com

www.circuitstream.com

facebook.com/circuitstream

@CircuitStream

linkedin.com/circuitstream