Launch your career in game development

A guide to getting started in the video game industry

THERE'S NEVER BEEN A BETTER TIME TO GET INTO THE VIDEO GAME INDUSTRY!

In just a few short decades, video games have grown from the hobby of a few to a global gaming market with active gamers making up over one-third of the world's population.

As games and technology become more advanced, new career opportunities arise, offering game creators unprecedented scope for creative expression through compelling storylines, captivating visuals, and immersive experiences.

This guide is to help you get started in the video game industry. You'll learn about the game development pipeline, explore different jobs, get career tips, and more!

$314+ billion
Projected worth of the global gaming market by 2027

270,000
Video game industry employees in USA alone

9.3%
Estimated growth of game dev and design roles from 2016 to 2026

3+ billion
Number of active gamers worldwide

50%
How much demand for real-time 3D skills has outpaced information technology skills by

100%
Amount the Women in Games Ambassador Program aims to increase the number of women working in games over the next 10 years

IN THIS GUIDE

Cover image: screenshot from "Wayfinder" (Airship Syndicate). CG Spectrum Game Design course grad Dave Sullivan worked on the game at Airship Syndicate.

Student Work: Marc Carrala Arce

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GAME DEVELOPMENT **PIPELINE**

Much like a production line, the game development pipeline helps organize the workflow required to create a video game so that everyone knows what they need to deliver and when. While pipelines vary between projects and studios, the process is fairly similar across AAA, indie, and mobile games.

Even if you're only responsible for one aspect of the pipeline, knowing every department's order and purpose can help you become a better game developer and an invaluable asset to your team.

PRE-PRODUCTION

STEP 1: CONCEPT

The game's concept is refined and expanded to articulate key elements. Designers work on the core vision and pillars to define the game and what will distinguish it from the competition.

STEP 2: DESIGN

A detailed design document is started— it outlines the game's core systems and how they work and includes rough plans for game stories, levels, technology, visuals, and other game elements.

STEP 3: RESEARCH TECHNOLOGY

Game engines, tools, pipelines, and software that's needed to build and develop the game are evaluated, developed, and tested.

STEP 4: VISUAL DESIGN

Early game visual concepts are conceptualized, designed, modeled, textured, animated, and tested before being built.

STEP 5: PROTOTYPE

Prototypes of core gameplay, visuals, a level, and other important aspects of the game are created, iterated, and tested to see if they are fun.

STEP 6: VERTICAL SLICE

A much more elaborate, playable version of the game, called a vertical slice, is created, which is representative of the final game experience.

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PRODUCTION

STEP 7: 3D MODELING

Game characters, enemies, vehicles, environments, buildings, objects, and more are created, modeled, textured, and made ready to be put into the game.

STEP 8: PROGRAMMING

Core gameplay systems are written by programmers in C/C++ while designers help implement, test, and evaluate everything to make sure it's fun and runs efficiently.

STEP 9: 3D ANIMATION

Elements such as characters, backgrounds, objects, vehicles, and weapons are animated.

STEP 10: LEVEL DESIGN

Level designers create a rough version of game levels. Artists then add quests, enemies, stories, puzzles, and all other aspects needed to bring game levels to life.

STEP 11: ARTIFICIAL INTELLIGENCE

The 'brain' of the game, made up of complex algorithms that customize gameplay, is programmed into the game.

STEP 12: CINEMATICS

Short narratives that drive the story, instruct on gameplay, or promote the game, are added.

STEP 13: INTERFACE

Heads up displays (HUDs) which update the player on progress, and menus instructing on objectives, available elements, and in-game purchases, are added.

POST-PRODUCTION FIX & POLISH

STEP 14: SOUND DESIGN

Dialogue, special effects, music, and foley are mixed and edited to create the final soundscape of the game.

STEP 15: EFFECTS

Visual effects, explosions, and other graphic elements are added and polished to make the game look great.

STEP 16: QA & REFINING

Quality assurance testers test the game and provide feedback. Sound and visuals are given a final polish.

JOBS IN GAMES

GAME DESIGNER

Focuses on the function of a game, creating systems, rules, gameplay, and worlds to ensure it's playable, fun, and engaging.

Specializations include:
- **Level designers:** focus on creating and implementing levels, environments, stories and quests.
- **Systems designers:** focus on designing and implementing the minute-to-minute gameplay systems, such as controls, movement, and combat, which make the game fun.

GAME PROGRAMMER

A field within software engineering. A game programmer, usually familiar with one or more programming languages, brings a game to life through their code. They may specialize in graphics, tools, artificial intelligence, audio, user interfaces, or networking.

> *As a game designer, your job is to find the elusive fun and make an engaging and compelling user experience.*
>
> — Troy Dunniway, CG Spectrum Game Design mentor

HOW TO BECOME A VIDEO GAME DESIGNER

Read more about this challenging yet rewarding role and get expert tips for entering this career path.

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Student Work: Kameron Barger

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GAME MODELER

Working from concept art, real-world reference, and scans, a modeler creates 3D assets such as characters, props, vehicles, weapons, and environments that populate and form the world of a game. They may also be responsible for texturing and shading assets and laying them out in the scene.

GAME ANIMATOR

Responsible for making 3D characters and other assets move through and interact with their digital environment, tied directly to game logic and design. Animation makes a game more dynamic, adds personality to its characters, and helps build on the overall realism and interactivity. Animators also make libraries of complex movements and cycles to be reused and repurposed.

TECHNICAL ARTIST (DEPARTMENTAL)

Often based departmentally, a technical artist works with game artists and developers to help bridge gaps in the pipeline between departments and troubleshoot technical issues. They also work on general research and development, create and maintain tools and plugins, and help optimize workflows. This is both a creative and technical role.

SOFTWARE QA TESTER

Ensures that software meets its intended purpose and is free of defects. Typically works with developers to identify and fix bugs before the software is released to customers.

GAME QA TESTER

Ensures that games meet certain standards of quality before they are released to the public. A game QA tester usually plays a game extensively, providing the team with feedback for user experience and playability.

SPLASH ART ILLUSTRATOR

Splash art is the digital art displayed between levels or loading screens in video games. Splash art illustrators are used for games that play individual matches (like *League of Legends*) or have frequent load screens. A splash art illustrator also creates art for a game's auxiliary media (booklets, marketing, etc.).

CONCEPT ARTIST

Develops the initial visual concepts (characters, props, vehicles, environments) from a script or creative brief. They set the tone and style of the work, giving life to an abstract idea. Concept art can be used as a reference point throughout a game's development.

PIXEL ARTIST

A digital artist who creates images using pixels as their only building blocks and typically limit their worl to 8 and 16-bit graphics. This is to closely match classic arcade and older console graphics, which are still popular today.

Click to learn more about each of these roles, including key responsibilities, salary range, and how to get started.

DISCOVER YOUR IDEAL GAMES CAREER:
cgspectrum.com/career-pathways

WAYS TO ENTER **THE INDUSTRY**

Here are some sure-fire strategies to help increase your chances of getting a job in game development.

GET THE SKILLS

Look at game studio job ads to see the skills they're hiring for. Then build those skills: download and learn relevant software, watch online tutorials, or enroll in an industry-focused course.

STAY AHEAD OF TRENDS

Seek out online tutorials, webinars, conferences, publications, and other game dev-related content to remain informed. See our resource section.

CREATE YOUR OWN GAMES

A great way to understand the rigors of game dev and showcase your talent and basic grasp of game production for potential recruiters.

PARTICIPATE IN GAME JAMS

A team challenge to produce a game in 24–72 hours, with participants taking on various roles. Gain experience, collaborate, and work towards a deadline. Use the final product in your reel.

ENGAGE WITH COMMUNITIES

Building connections is vital to getting your name and skills recognized, and a chance to interact with industry pros who can offer advice or even jobs.

BUILD A STRONG PORTFOLIO

This helps recruiters see if you're a good fit with their company. Put your best work up-front and show each project's process from initial concept to execution.

INTERN AT A GAME STUDIO

Not always a viable option, but it can be a great way of gaining hands-on experience while also networking.

GET A GAME QA JOB

Kick-start your career with a job in Quality Assurance. Expand your gaming knowledge by testing and pushing in-production games to their limits.

COLLABORATE WITH PEERS

Working with your peers is fun, you can learn from each other and tackle bigger projects.

APPLY FOR PRODUCTION ROLES

Some production roles (e.g., runner, production assistant) don't require experience and can help get your foot in the door of a studio.

GET A DEGREE

Although more expensive and time-intensive, computer science degrees are still well-regarded and useful for breaking into the industry.

Student Work: Jake Baker

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WHERE TO FIND **INTERNSHIPS**

2K
2k.com/en-US/jobs

ACTIVISION
careers.activision.com/students

BANDAI NAMCO
bandainamcoent.com/careers

BLIZZARD
careers.blizzard.com/global/en/internships

EA
ea.com/careers/interns-and-university-graduates

EPIC GAMES
epicgames.com/site/en-US/earlycareers

FAST TRAVEL GAMES
careers.fasttravelgames.com/#jobs

IO INTERACTIVE
ioi.dk/careers

MICROSOFT
careers.microsoft.com/us/en/gamingjobs

ORBITAL KNIGHT
orbitalknight.com/careers

RIOT GAMES
riotgames.com/en/university-programs

ROBLOX
careers.roblox.com

ROCKSTAR GAMES
rockstargames.com/careers

RESPAWN ENTERTAINMENT
respawn.com/internships

ROVIO
rovio.com/interns

SEGA
recruit.sega.jp/en/internship

SUPERCELL
supercell.com/en/careers

THE FARM 51
thefarm51.com/eng/careers

WARGAMING
wargaming.com/en/careers

OTHER RESOURCES

- **ArtStation Jobs:** artstation.com/jobs
- **European Games Developer Federation:** egdf.eu/join-the-european-games-industry
- **Game Developer:** gamedeveloper.com
- **Creative Heads:** creativeheads.net
- **Game Jobs:** gamejobs.eu
- **Game Job Hunter:** gamejobhunter.com
- **Game Dev Jobs:** gamedevjobs.com
- **TIGA:** tiga.org/jobs

ADDITIONAL TIPS
- Enquire directly with smaller studios.
- Research the studio(s) behind your favorite games to find possible opportunities.

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FREE SOFTWARE & RESOURCES

SOFTWARE

Unreal Engine: real-time game engine

Unity: another real-time game engine

Blender: 3D modeling and animation software to create your own game assets

TurboSquid: buy ready-made 3D assets

Unreal Engine Marketplace: build 3D worlds using free downloadable assets

GIMP: 2D image editing tool for tasks like photo retouching, image composition, and image authoring

Inkscape: open-source tool to help create vector graphics and jot down ideas visually

MidJourney: handy AI imagery too useful during the brainstorming phase of a project

ChatGPT: can aid in streamlining some game design processes by generating code and even designing game assets

Twine: open-source tool for telling interactive, nonlinear stories that can be extended with variables, conditional logic, images, CSS, and JavaScript

Stencyl: video game development tool that allows users to create 2D video games for computers, mobile devices, and the web

GameMaker: 2D game engine

Audacity: digital audio editor and recording application software

Nuclino: documentation, worldbuilding, and planning tool

GitHub: discover, share, and contribute to software

PhysicsJS: modular, extendable, and easy-to-use physics engine for javascript

OTHER RESOURCES

Explore **Unreal Engine's free courses**

Explore Game Development **Career Pathways**

Join the **Epic Games Dev Community**

Visit ArtStation's **Unreal Engine channel**

Check out **Game Jam Tips and Tricks** from Epic Games' developers

Read helpful articles on **80 Level**

Learn to design video games with **gamedesigning.org**

Watch tutorials on the **Game Maker's Toolkit** YouTube channel

Follow Level Designer **Tommy Noberg** on Twitter

Reference **Splash Damage**'s game design document when creating your own

Student Work: Noor Vullinghs

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QUESTIONS TO ASK BEFORE ENROLLING IN A GAME DEV COURSE

Below are a few things to consider when choosing a game development school or course.

WHO TEACHES THE COURSES?

Look for institutions whose teachers have actual industry experience. It means you'll be learning from people who have put their knowledge into practice and can offer unique industry insights.

HOW DO STUDENTS INTERACT WITH THEIR TEACHER(S)?

Check what interaction you'll have with the person teaching you—is it just via pre-recorded videos, or do you get to interact with them in real-time? Being able to ask your teacher questions and get personalized feedback on your work is crucial.

WHO CREATED THE CURRICULUMS?

Ideally, you want to attend a school where course curriculums are created in-house by experts with both industry and teaching experience.

WHAT IS THE STUDENT SUCCESS RATE?

High student success rates often mean that you'll be learning skills that will help you land a job in the industry after graduating. It may also indicate that the training center offers additional services like career counseling and training to help you get ahead.

WHAT SOFTWARE WILL BE TAUGHT AND IS IT INCLUDED IN THE COST?

Having software included in the course fees means less overheard costs for you. Additional tip: check if the school is an academic partner or authorized training center for the software you'll be using—this ensures you're getting a quality education vetted by reputable companies.

WHAT PARTNERSHIPS DOES THE SCHOOL HAVE?

Does the school have any partnerships you could leverage down the track? As mentioned before, partnerships help ensure schools provide quality courses vetted by reputable external companies.

WHERE IS THE SCHOOL LOCATED?

You want to avoid a difficult commute or moving house to attend classes. Online courses are a great alternative because they allow you to study from anywhere and save on travel expenses.

WHICH STUDIOS DOES THE SCHOOL HAVE STRONG RELATIONSHIPS WITH?

Good schools will always work closely with leading studios. This means they will often have guest speakers, events, and recruiters helping ensure the school stays relevant and on track.

WHAT ELSE DOES THE SCHOOL OFFER?

Do you just receive coursework, and that's all? Consider the additional selling points that make the school unique. Do they offer career advice and counseling? Are there free expert-led talks and events on offer? Do they organize fun extracurricular activities and student challenges? Is there a strong sense of community to make your learning experience more enjoyable and collaborative?

GLOSSARY

For a more extensive list of terms check out Game Developer's Critical Glossary.

AAA (TRIPLE-A): a mid-sized or major game publisher with more robust budgets than other tiers of studios to produce (usually) higher-selling, retail AAA games (e.g., Electronic Arts, Nintendo, Ubisoft).

AGENT: In-game character or object that uses AI to interact with other objects in its environment.

ALPHA: Version of a game with all major features and most assets, commonly shared internally to test for quality and bugs.

ASSET (ALSO 3D MODEL): Digital 3D model used in a game such as props, characters, set dressing, environments, etc.

BALANCE: Process of tuning a game's mechanics to ensure its difficulty level is not too hard but not too easy so it remains fun for people to play.

BETA: Version of a game containing all major features and assets with no major bugs. It should be more complete than alpha, and on its way to code release.

BUG (ALSO DEBUG): Any development issue that makes a game tedious, unstable, or unplayable in its current state. The solution is to find and remove them (debug).

BUILD (ALSO RELEASE): Game development term for the "version" of a game.

CINEMATIC (ALSO CUTSCENE): Non-interactive scenes in a game primarily used for storytelling, instructing on gameplay, or promoting the game.

CODE (ALSO SOURCE CODE, SCRIPT): Computer instructions written in a programming language (C++, Java, Python, etc.) by programmers or through machine learning (AI), to power a game and help it to function.

CULLING: Detecting, isolating, and removing any unnecessary data.

EVENT: Game action executed through player input (e.g., pressing a controller or keyboard button or to make a character move).

GAME ENGINE (ALSO REAL-TIME ENGINE): Digital tools and features that allow game developers to build games and create and display real-time interactive content (e.g., Unreal Engine, Unity).

GDD (GAME DESIGN DOCUMENT): Document created by game developers to define and justify their game, often used to pitch to publishers. It should include the story, gameplay, characters, level design, and other integral game information.

INDIE (SHORT FOR INDEPENDENT): Game or studio usually formed by individuals or smaller parties with less or no financial backing and technical support from a larger game publisher.

Student Work: Oliver Rotter

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MECHANICS: Essential functions, rules, and outcomes of gameplay that make a game rewarding, fun, and interactive.

NPC (NON-PLAYER CHARACTER): In-game characters that can't be controlled by players. Also called AI characters.

OPTIMIZATION: The process of making improvements on a game (e.g., frame rate, size, memory usage, battery usage, etc.) to help its overall performance, so it loads and runs more efficiently.

PHYSICS: Applying real-life laws of physics in games to make movement and environmental behaviors more realistic.

PIXEL: The smallest building-block of a screen image, made of light and colors.

PROTOTYPE: A small, limited, early version of a game (or part of) often used for testing.

REAL-TIME RENDERING: The process of converting a scene into display pixels at real-time rates such as 24, 30, 60, and 90 frames per second for immediate playback.

RENDER: The process of digitally generating an image or video based on 2D, 3D, and lighting information. Traditional offline rendering can take minutes or even hours to finish.

RPG (ROLE-PLAYING GAME): Game genre where players take on fictional character roles, developing them by interacting with other players or NPCs and making decisions that affect a game's outcome.

RTS (REAL-TIME STRATEGY) GAME: Game genre where participants play simultaneously (rather than taking turns) towards common goals.

SERVER: Specialized computer, or network of computers, where remote players connect via the internet to play games with other players across the world.

TDD (TECHNICAL DESIGN DOCUMENT): Written document created by game programmers, detailing a game's technical plan; e.g., how the code and architecture will be constructed, how servers will be configured, etc.

TILE: Image that is used to create other, bigger images (such as a platform) in a 2D game.

UI/GUI (USER INTERFACE / GRAPHICAL USER INTERFACE): Menus, inventories, and other non-game interactive systems on-screen.

UX (USER EXPERIENCE): The design and implementation of how players interact with a game's interface and features.

VECTOR GRAPHIC: Type of graphic image that uses 2D points to connect lines and curves, allowing it to be scaled and customized.
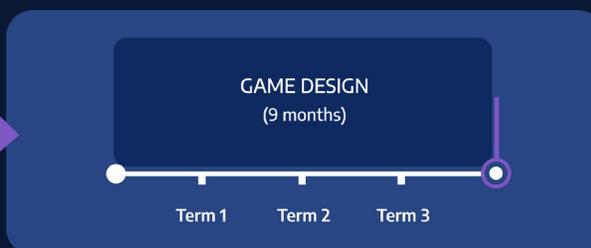
VERTICAL SLICE: Proof-of-concept portion of a game, typically given to investors or publishers for potential funding and partnerships.

WORLD BUILDING: Form of visual storytelling to develop a coherent virtual world, created in a game engine or 3D software. Elements to consider include history, geography, and ecology.
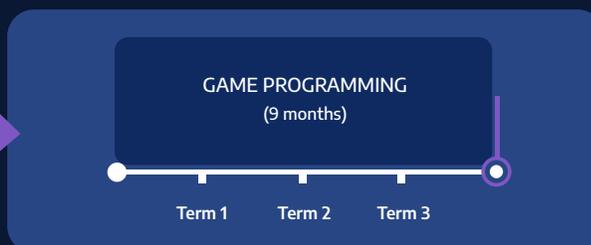
GAME DEVELOPMENT COURSES
TO ADVANCE YOUR CAREER

Strengthen your career opportunities with personalized career training and mentorship from industry experts at CG Spectrum. Build practical job skills with a specialized curriculum, meet your mentor for a live weekly Q&A session, get feedback on your work, access extra career services, and grow with a community of like-minded peers. Click on a course pathway below to learn more.

GAME DESIGN

INTRODUCTION TO GAME DESIGN
(3 months)

Term 1

GAME DESIGN
(9 months)

Term 1   Term 2   Term 3

GAME PROGRAMMING

INTRODUCTION TO GAME PROGRAMMING
(3 months)

Term 1

GAME PROGRAMMING
(9 months)

Term 1   Term 2   Term 3

REAL-TIME 3D & VIRTUAL PRODUCTION

FOUNDATIONS OF REAL-TIME 3D & VIRTUAL PRODUCTION
(3 months)

Term 1

REAL-TIME 3D & VIRTUAL PRODUCTION
(9 months)

Term 1   Term 2   Term 3

ISTQB® CERTIFICATION COURSES

SOFTWARE TESTING FOUNDATIONS
(2 weeks)

ADVANCED SOFTWARE TESTING
(2 weeks)

TEST MANAGER
(2 weeks)

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YOUR FUTURE
IN GAMES AWAITS!

> *At the heart of most games and player experiences are the characters, worlds, maps and levels which players interact with and in. These are the magical places that capture our imagination.*
>
> — Troy Dunniway, CG Spectrum Game Design mentor

cg spectrum

Established in 2011, CG Spectrum is a global top-ranked training provider for the film and game industry offering specialized programs in animation, digital painting, game development, 3D modeling, VFX, virtual production, and 3D visualization. CG Spectrum inspires and trains creators through a unique online learning model and personalized mentorship from industry professionals.

Learn more about the curriculum, fees, and how to get started at cgspectrum.com/game-development

chaos academic *partner*

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