GAMES

BSc (Hons) GAMES PROGRAMMING

2 Year Accelerated & 3 Year Courses Available

Why choose this course?

At SAE, you'll learn the core languages powering the games industry - C#, C++, Blueprints, and scripting workflows - building gameplay systems, AI, tools, and more across real prototypes every trimester.

You'll gain deep experience in Unreal Engine 5 and Unity, study algorithms, data structures, and optimisation, and tackle multiplayer, networking, and platform porting as your skills develop. Taught by experienced games programmers, you'll collaborate cross-discipline with Artists and Designers just like a real studio, developing project management skills and a professional portfolio that reflects genuine industry experience.

Graduate in two years on the accelerated route with a portfolio of playable games and experiences.

Industry relevance

Games programming sits at the technical core of one of the most innovative and fast-moving industries in the world - and skilled programmers who can work across engines, disciplines, and platforms are in consistent demand. At SAE, you'll train in state-of-the-art computer labs with unlimited access to industry-standard software, completing projects that mirror real-world studio scenarios and building the technical confidence and creative problem-solving ability that employers look for from day one.

Career outcomes

Our graduates progress into roles including Gameplay Programmer, AI Programmer, Tools Programmer, Engine Programmer, Technical Designer, Networking Engineer, Graphics Programmer, and XR Developer - with programming skills that transfer equally into app development, software engineering, simulation & interactive media.

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MODULE BREAKDOWN

The purpose of this module breakdown is to provide a concise summary of the main topics covered on the Games Programming programme offered at SAE.

Trimester 1/Semester 1

At the start of your learning journey, you'll develop fundamental skills and knowledge in game programming and development that will lay the groundwork for the rest of your course, as well as your career as a whole.

GP (T1) - Game Programming Basics

In this module, you'll learn games programming fundamentals such as object-oriented programming (OOP) and common algorithms used in game development.

You'll also explore core mathematics and other foundational programming skills, from logic operations to basic vector mathematics.

Topics include:

- Programming Basics
- Structured Programming
- Object-Oriented Programming
- Introduction to Algorithms
- Vector Arithmetic
- Version Control

GD (T1) - Game Development Basics

Across this module, you'll gain an overview of the concepts and practice of games design. As you research elements of game design and learn to create your own, you'll explore game mechanics and mechanisms and the functionality and operation of game engines. Finally, you'll apply game mechanics and mechanisms used in common game engines to a real-world game project.

Topics include:

- Game Design Fundamentals
- Game Engine Basics
- Game Mechanics
- Game Production
- Introductory AI & Player Statistics
- Narrative Systems

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Trimester 2/Semester 2

In your second trimester, you'll continue to develop your programming skills. As you explore structured game development and game dynamics, you'll also learn about artificial intelligence algorithms that can enrich the games world.

GP (T2) - Structured Game Development

In this module, you'll further develop your technical programming skills as you learn to distinguish between different software architectures.

You'll also learn about code optimisation and how this can be leveraged across your own game projects.

Topics include:

- Game Programming Patterns
- Data Structures
- Software Architecture
- Copyright Basics
- Game Production Basics
- Optimisation (Profiling)

GP (T2) - Game Dynamics

In this module, you'll explore the concepts of both procedural content development and artificial intelligence (AI).

With a basis in statistics and heuristics, you'll learn to develop generative and procedural content for a game world, along with basic AI systems. You'll then implement these through non-playable characters (NPCs) within a game project.

Topics include:

- Statistics Heuristics
- AI Fundamentals
  - Pathfinding
  - Behaviour Trees
  - Finite State Machines
- Composition Algorithms, e.g.
  - Maze, Dungeon and Landscape Composition Algorithms

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Trimester 3/Semester 3

During the third trimester, you'll be introduced to the professional working environment through several real-world project briefs. Creative Studio lets you polish your skill set with practical assessment activities that reflect modern industry practices.

GP (T3) - Creative Studio 1: Overview

In collaboration with game designers, game programmers are a critical component of meeting a game project's technical needs. In this module, you'll learn how to design a level, and then develop all the necessary systems and tools for a functional, immersive and dynamic world – including shaders, special effects, level lighting, functionality-extending tools and advanced procedural content algorithms.

Topics may include:

- Level Design
- Computer Graphics
- Shader Programming
- Lighting
- Animation Programming (IK, FK)
- PCG Advanced (L System, Generative Algorithms)
- Persistent Data

Trimester 4/Semester 4

This trimester, your primary focus will be on exploring professional workflows for environment creation and real-time games programming.

GP (T4) - Creative Studio 2: Overview

In your second Creative Studio module, you'll be introduced to network fundamentals and operations for multiplayer games. You'll explore the mobile development process while optimising and improving a project's performance.

A key aim of the module is to identify a target market and develop a product that can be distributed to a paying audience. This will see you teaming up with students from other SAE programmes, such as Game Art and Animation and Games Design, for creative collaboration opportunities.

Topics may include:

- VR/AR development
- Specific Platform Development
- Mobile Development
- Performance Optimisations Multithreading
- Performance Analysis
- Business Planning
- Marketing

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Trimester 5/Semester 5

As you approach the end of your degree in games programming, you'll decide on your area of professional interest and develop a deeper knowledge of your chosen field.

GP (T5) - Advanced Specialised Production

In this module, you'll expand on your existing knowledge and produce work of a professional calibre within your field of expertise. Choose to participate in real-world projects via internships, collaborate with peers across diverse creative fields, tackle simulated briefs or develop your own projects. This subject provides a platform for you to hone your skills, build your network and curate a portfolio that showcases your talents.

Topics may include:

- Machine Learning
- AI Advanced (GOAP, Utility AI)
- ECS
- Compute Shaders
- VR/AR Development
- Physics

GP (T5) – Research and Professional Development in Creative Media

In this subject, you'll prepare for your final Major Project, craft your project proposal with guidance from our SAE Experts. You'll also enhance your essential academic and professional skills, which will prove useful when applying for jobs in the industry or pursuing postgraduate studies.

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Trimester 6/Semester 6

In the last module of your games programming course, you'll demonstrate the practical and academic skills you've developed across your 2 years at SAE via a large-scale advanced-level project.

GP (T6) – Major Project

Your degree in games programming culminates with your final Major Project, which you'll have planned out during Trimester 5.

This module allows you to refine your skills in your chosen area of interest, executing a project from start to finish and enriching your portfolio. Your Major Project will see you connect with industry professionals, strengthen your resume and potentially even springboard into entrepreneurship after graduation.



WANT TO KNOW ABOUT GAMES AT SAE?

If you need help at any point during your application process, our friendly Admissions Team are here to help at every step of the way.

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READY FOR THE NEXT STEP? APPLY TODAY!

Scan the QR code to begin your application for our BSc (Hons) Games Programming at SAE.