

2015 Course Guide

Advanced Diploma of Professional Game
Development (10343NAT)
specialising in Game Programming

Online Campus

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Overview

Simple description

We welcome you to study at the AIE.

The Advanced Diploma of Professional Game Development, specialising in Game Programming, is intended to equip you with the technical skills needed to work as a game programmer for a large game studio, small independent games developer, or related industry requiring simulations for training or other purposes. You will also learn the skills necessary to lead others in the planning and development of a computer game.

What will you learn?

Upon successful completion of the full course you will have the skills, experience and confidence to demonstrate the following:

- Utilise effective programming techniques for games, simulation and related industries
- Communicate effectively with stakeholders and team
- Plan and develop a complex computer game
- Lead and manage others in the development of a complex computer game
- Effectively define goals to promote yourself for work in the games, simulation and related industry

What is the qualification you will receive?

After the successful completion of the full course you will be entitled to an Advanced Diploma of Professional Game Development (10343NAT). Completion of the course also serves as a valuable bridge to further study into higher level qualifications.

What software will I be using?

Some of the software packages, integrated programming environments and programming languages you will be using throughout the course will include:

- C / C++ / C#
- Microsoft's Visual Studio
- Unreal Engine 4
- Unity3D
- DIA
- OpenGL
- FMOD / RakNet / Nvidia's PhysX SDK
- Sony's PlayStationMobile SDK
- Various Open-Source libraries

Access to Important information

Information about competency based training and assessment, support services, harassment, grievances, and your rights and obligations can be found under the "student information" tab on the AIE website. The "policy and procedures" link will direct you to where individual reference documents can be downloaded and read.

We very strongly encourage you to make yourself aware of this information, in particular the "Student handbook".

Link : <http://www.aie.edu.au/>

Your teaching staff

Any type of help outside class time

Use helponline@aie.edu.au for all emails relating to:

- assistance for log in details
- software and hardware assistance / advice
- subject content assistance / assistance for assessments
- bookings of virtual classrooms
- teacher help / questions outside class times
- other general assistance questions

The email is set up specifically for these things and is monitored more closely by several people to ensure a faster response.

Emails sent directly to staff may not receive a response in a timely manner due to work loads and work hours.

Subject and course enrolment queries / processing

For all enquiries relating to enrolling in subjects or your enrolment in the course please use onlineenrolment@aie.edu.au.

Teaching Staff

Jason King

Sam Cartwright

Esme Salmone

Jacob Connelly



Head of Department

Conan Bourke

Head of School

Lea Michael

Admin Manager / Student Liaison Manager

Josh Skeates

online @aie.edu.au

Learning Program – Scheduling

Term dates and holidays

Subject timetables are available leading up to each term on the Online Enrolment page in AIEPortal and in the subject guides located in the same place.

TERMS	START DATE	END DATE
Term 1	23rd February 2015	3rd July 2015
Term 2	20th April 2015	4th September 2015
Term 3	20th July 2015	27th November 2015
Term 4	7th September 2015	29th January 2016

Holidays	START DATE	END DATE
Holiday 1	13th April 2015	17th April 2015
Holiday 2	6th July 2015	17th July 2015
Holiday 3	28th September 2015	2nd October 2015
Holiday 4	21st December 2015	1st January 2016

Public Holidays

- 9th March 2015
- 3rd April 2015
- 6th April 2015
- 8th June 2015
- 28th September 2015
- 5th October 2015
- 26th January 2016

Learning Program – Training Description

Listed herein are the subjects you will be learning.

Stream Subjects

Introduction to C++

This subject is programming 101 where you start as a beginner programmer, progressing to being a confident, intermediate level C++ game programmer.

The focus is on learning the language structure and usage step by step, using compiling and debugging tools, and structuring an Object-Orientated project to complete development of simple games. This subject covers C++ from the ground up.

Knowledge and skills

- C++ Programming Language
- Object-Oriented Programming
- Application Development

Assessable units of competency

- ICAPRG406A - Apply introductory object-oriented language skills

Code Design and Data Structures

This subject develops your skills in designing, planning, implementing and testing complex coding structures that can be applied to many Object-Orientated programming languages.

Learn various design skills including Pseudo-Code and UML to help in designing and understanding common algorithms used within game development. Through this subject you will gain a deeper understanding of the importance of algorithm efficiency and algorithm testing that can be applied to almost any programming language.

Knowledge and skills

- Object-Oriented Design
- Software Architecture
- Algorithm Design

Assessable units of competency

- ICAPRG415A - Apply skills in object-oriented design

Maths for Games

This subject introduces the necessary mathematics used in real-time games and simulations.

Students will learn complex transformations in 2D for real-time entities along with various trigonometric and interpolation maths. In addition students will cover various geometric intersection tests.

Students will package up their mathematics code within C++ libraries to be used with a provided application that makes use of and tests the accuracy of their code.

Knowledge and skills

- Linear Algebra
- Real-time Transformations
- Software Libraries

Assessable units of competency

- ICAPRG416A - Manage a software component reuse library
- ICAPRG527A - Apply intermediate object-oriented language skills
- PGDMTH601A - Apply fundamental games programming mathematical skills

Artificial Intelligence for Games

Forget Pinocchio, in this subject you will develop your own Artificial Intelligence (A.I.).

Develop your skills to design multiple A.I. states for a non-playable character (NPC).

Upon completion of this subject you will be able to provide NPCs with personality and make them a challenge for even the most seasoned gamer.

Knowledge and skills

- Pathfinding
- Steering Behaviours and Locomotion
- Decision making Techniques
- Game A.I. vs Academic A.I.

Assessable units of competency

- ICAGAM404A - Apply artificial intelligence in game development

Introduction to C#

With this subject you are introduced to the C# programming language and how to create tools and applications to assist in game development.

While learning the C# programming language you will learn to design and create Windows Forms programs that can be used for various tools including A.I. editors, image editors and other applications that can assist in the development of games and simulations.

Knowledge and skills

- C# Programming Language
- Managed Code
- Tools Development

Assessable units of competency

- ICAPRG418A - Apply intermediate programming skills in another language
- ICAICT406A - Build a graphical user interface

Cross-Platform Development

This subject is your introduction to the most important aspect of many games, cross platform development issues.

While further extending your skills in the C# programming language you will explore the different complexities that a developer is faced with when planning, designing, coding and creating a cross platform game.

Upon completion of this subject you will be able to use the C# language to develop games and be able to plan and manage cross platform development of a game.

Knowledge and skills

- Developing for other platforms
- Real-time Game Design
- Sony PlayStation Mobile Development

Assessable units of competency

- ICAGAM510A - Prepare games for different platforms and delivery modes
- ICAPRG523A - Apply advanced programming skills in another language
- ICAPRG504A - Deploy an application to a production environment

Computer Graphics

This subject takes you on a learning journey of making great looking graphics simulations in 3D using OpenGL with C++.

Discover the formulas that can display amazing looking effects. Learn how to create graphical simulations used in cutting-edge video games by pushing the Graphics Processing Unit (GPU) to its limits!

You will complete this subject having created a series of graphics demonstrations.

Knowledge and skills

- Real-time Computer Graphics
- Real-time Lighting Equations
- OpenGL Shader Programming
- Procedural Techniques

Assessable units of competency

- ICAGAM508A - Develop complex 3-D software for games and interactive media
- ICAPRG505A - Build advanced user interface

Complex Game Systems

In this subject you will learn algorithms used to build up complex game systems that can be reused in several games.

You will build upon your A.I. skills and look in to Network and Audio programming, making use of the RakNet and FMOD libraries commonly used in game development.

Students will also look into Automated Build Systems used in game development along with Analytics used to study aspects of user behaviour when your game is being played.

Knowledge and skills

- Concurrent and Parallel Programming
- Networking
- Audio
- Advanced A.I. techniques

Assessable units of competency

- PGDGSP601A - Develop complex systems for real time applications

Physics for Games

This subject will build your understanding of how to integrate physics into your game using the most powerful 3rd party software available.

You will create a physics based playground to integrate ragdoll, spring, cloth and collision physics into your game. Gain a greater understanding of how to implement physics to create fun gameplay mechanics.

Upon completion of this subject you will understand and have a practical knowledge of how physics can be used to enhance your games.

Knowledge and skills

- Real-time physics libraries
- Rigid Body Physics

Assessable units of competency

- ICAGAM508A - Develop complex 3-D software for games and interactive media
- ICAGAM515A - Design and create advanced particles, fluids and bodies for 3-D digital effects

- ICAGAM530A - Develop and implement physics in a 3-D digital game

Core Subjects

Production Teams

Working with artists, programmers and designers as a team you will learn how game development teams work.

The subject will begin team building and early project development. The goal is to get organised into a production team and think about the scope and challenge of making computer games together.

This subject is designed to give you a strong understanding of how to organise and plan a production for a team of developers. The first focus will be in getting organised and working in teams.

Knowledge and skills

- You'll get a clear understanding of how the different disciplines of game artist, game designer and game programmer work and how they work together
- You'll learn what tools they use, what they each produce and what they contribute to the team
- The second focus will be on creating game ideas that are practical, achievable and worthy of further development
- You learn about filtering, refining, recording and pitching ideas
- Upon completion of this subject you'll have a strong understanding of how teams produce games and what they can achieve
- You'll also have a collection of strong clear game ideas that have been planned and are ready to be developed

Assessable units of competency

- BSBCRT501A - Originate and develop concepts
- BSBWHS501A - Ensure a safe workplace

Practice Production

Working with artists, programmers and designers this will be your first taste of a project run under proper production conditions.

You will be writing design documentation, setting schedules, testing products, filing bug reports and contributing to design discussions. You'll bring ideas, assets and other material developed in production teams to this subject for further development together with designers and artists.

If you have ever wondered what it is like to work in the games industry, you begin to find out during this project.

This subject is designed to get teams of programmers, artists and designers working together on projects.

Knowledge and skills

- You'll get a clear understanding of how a team produces a computer game
- You'll have a firsthand understanding of the challenges and difficulties involved in game production
- You'll gain a firsthand realistic understanding of how the scope of a game project can be balanced with the time and resources available to produce it
- You'll make computer games

Assessable units of competency

- BSBPMG522A - Undertake project work
- CUAPPM502 - Realise productions

Proof of Concept

This subject will bring all your current work and development together into a promising prototype.

Your development on earlier projects will be refined and filtered, leaving your most promising projects.

You'll continue working with artists, programmers and designers. You will be tasked with the construction of a small set of polished game prototypes to prove game play ideas, business models and production plans.

You'll pitch these game ideas to a specially selected panel of industry professionals and game developers. You'll seek their feedback and advice on selecting a game project for your final major production.

This subject is focused on choosing an idea worthy of development.

You will also be generating a plan for a portfolio. This part of the subject is designed to ensure you have a strategic plan to present a portfolio of your work to prospective employers. Overall this project is designed to ensure you can identify the standard of quality required and how you can improve to meet that standard.

Knowledge and skills

- You'll be introduced to business models and financing opportunities
- You'll present your prototype and ideas to professional game developers seeking advice and feedback
- You'll conceive, develop and test a plan for the major game production
- Strategic planning
- Understanding and using online promotional opportunities
- Ensuring you can access regular valid feedback
- Using feedback to improve
- Generating a continuously improving portfolio of work

Assessable units of competency

- PGDGPR601A - Plan and pitch game design proposal
- ICAICT417A - Identify, evaluate and apply current industry-specific technologies to meet industry standards
- PGDPRD604A - Implement online promotional strategy – Planning elements

Major Production

This is the capstone subject in the Advanced Diploma of Professional Game Development. You'll produce a game that has been researched and prototyped in the previous core subjects.

You'll work with artists, designers and programmers to produce a full game as a team, pulling in knowledge gained from all your stream subjects.

In addition you'll prepare an online portfolio for yourself.

Knowledge and skills

- You will have worked extensively on game projects
- You will have worked extensively with a team of game developers
- You will have a polished game in your portfolio
- You will be an independent game developer

Assessable units of competency

- ICAGAM503A - Create a complex 3-D interactive computer game
- ICTSUS6233A - Integrate sustainability in ICT planning and design projects
- PGDPRD603A - Manage major game production
- ICAGAM511A - Manage testing of games and interactive media
- PGDPRD604A - Implement online promotional strategy – Production elements

Learning Program Assessment

How will I be assessed?

The Advanced Diploma of Professional Game Development (10343NAT) is a nationally accredited course of study. During the course you will be given clear and specific instructions on what you must learn, how you'll be assessed and what you must do to show you are "competent". You must be present on specific assessment days to demonstrate your competence.

Your assessment is "un-graded". This means you can only be assessed as "competent" or "not-yet-competent".

To earn your qualification you must be assessed as competent in all the nationally accredited units required by your qualification.

Details of the assessment process

Each assessment item has units of competency associated with them. In order to pass an assessment item you must be deemed competent in every associated unit of competency. Where individual units of competency requirements are not met a reassessment will be organised by AIE course coordinators and teaching staff.

Assessments are conducted at a presentation interview on a specific assessment day. Written assessment results are given back to you promptly.

AIE policy on assessment and reassessment

Assessment day

Assessment at AIE is conducted in specific tutorial sessions within each subject of study. This is done in conjunction with your assessor in an interview style meeting. You as a candidate must be present on assessment day to actively present your evidence for assessment. You will be assessed on the evidence you present on that day. You'll receive formal feedback on your progress on assessment day.

Valid reasons to have the assessment moved to another day must be arranged with your assessor **at least one day in advance**.

Invalid or unexplained absences from assessment day will constitute a failure to actively present evidence of competency and will result in a grade of "not yet competent".

Reassessment day

If you cannot sufficiently demonstrate to your assessor that you are competent on assessment day you will be given a reassessment opportunity no later than 2 weeks following your initial assessment. This reassessment day will be conducted in the same manner as the initial assessment day.

If, after this second attempt you are still unable to demonstrate competence to your assessor, you will need to negotiate an extension beyond the end of the subject with the teacher. From there you will be passed to the student liaison officer to discuss how to submit outstanding assessments and a meeting with an intervention panel will be offered to assist with planning the completion of outstanding work.

If you are not successful in completing the third submission a fee for further assessment will be incurred.

If you are not successful in completing several subjects you will be passed to an intervention panel to address and discuss your progress at AIE.

Requests for Extensions

Requests for extensions must be negotiated with your teacher on an official extension application form prior to the assessment date. Valid and relevant evidence should be attached to the form (i.e. doctors certificates).

Plagiarism

Students have a responsibility to complete all assessment tasks honestly, without any form of cheating, plagiarism or violation of copyright. Failure to uphold this responsibility can lead to suspension or expulsion depending on the severity of the offence. For more information regarding what constitutes as "copyright", please consult your teacher.

Student appeals and grievances

AIE's Student Handbook contains all information about appeals and grievances. Students are required to read and understand these policies. The Handbook can be found on the AIE website. A link from your AIEPortal course is available as well. Also follow this link:

<http://www.aie.edu.au/StudentInformation/PoliciesProcedures>

Grievances and appeals may be directed to your teacher or administration manager, who will contact the appropriate person to assist.

Further information on AIE assessment and reassessment policy

AIE's Student Handbook contains all information about assessment and reassessment policies. Students are required to read and understand these policies.

The Handbook can be found on our website under Student Information.

Link : <http://www.aie.edu.au>

Units – Advanced Diploma of Professional Game Development

ADVANCED DIPLOMA OF PROFESSIONAL GAME DEVELOPMENT
ICAPRG406A – Apply introductory object-oriented language skills
ICAPRG415A – Apply skills in object-oriented design
ICAPRG416A – Manage a software component reuse library
ICAPRG527A – Apply intermediate object-oriented language skills
PGDMTH601A – Apply fundamental games programming mathematical skills
ICAGAM404A – Apply artificial intelligence in game development
ICAPRG418A – Apply intermediate programming skills in another language
ICAICT406A – Build a graphical user interface
ICAGAM510A – Prepare games for different platforms and delivery modes
ICAPRG523A – Apply advanced programming skills in another language
ICAPRG504A – Deploy an application to a production environment
ICAGAM508A – Develop complex 3-D software for games and interactive media
ICAPRG505A – Build advanced user interface
PGDGSP601A – Develop complex systems for real time applications
ICAGAM515A – Design and create advanced particles, fluids and bodies for 3-D digital effects
ICAGAM530A – Develop and implement physics in a 3-D digital game



Learning Program Classroom

Work Environment

All courses delivered at AIE are designed to simulate “real-world” film and game studio employment conditions. For the online campus the emphasis is placed upon independent studio work typically conducted across distances through various internet means. This is achieved through:

- Mentoring by experienced teaching professionals from the games and film industry.
- Adhering to industry work specifications, standards and production pipelines.
- Students taking on production roles, as per industry production environments, and as per their individual areas of specialisation (i.e. 3D Animation, 3D modelling, texturing, etc.).
- Using identical software and hardware to what is used in the industry.
- Having key project work assessed and feedback given by experienced professionals from the games, film and education industries.

Industry speakers

Guest industry visits and presentations will be organised to assist you with your study. Please be aware that these presentations may be organised outside of the formal class times based on the industry professional’s availability.

Lectures

Lectures are a mix of live and pre-recorded sessions and attendance is not required. They are timetabled during the day to maximise the opportunity for evening tutorial sessions where students are strongly encouraged to attend as much as possible.

Lecture recordings are accessible through AIE Portal.

Tutorials

Throughout subjects sessions are allocated for students to complete assessable work. The teacher will be available to assist you during these sessions.

Open Rooms

Throughout the year each course has a dedicated Open Room where a teacher will be present and available to help anyone from any subject with course work or assessments. No booking is required however when there are several students it is first in first served. If more than a few students turn up another teacher will join in to assist. These are currently running during the day because it is for help only.

To find out the timetable please contact online@aie.edu.au or check the timetable in the enrolment section of AIEPortal.

Throughout the semester sessions are allocated for students to complete assessable work. The teacher will be available to assist you during these sessions.

Attendance

Your attendance is recorded electronically at the start of the tutorial session you have elected to attend.

AIE encourages you to contact administration if you will be absent from several tutorial sessions or cannot attend many of them due to work or other commitments. You can do this via emailing the administration manager via online@aie.edu.au.

You'll need to provide a medical certificate or appropriate documents to your teacher if you are unable to attend class for long periods of time and cannot submit assessments as a result. If a medical certificate or appropriate documents are not provided a non-attendance mark will be recorded against your file. Falling below 80% attendance will hinder and may prevent your successful completion the course.

NOTE: In a Virtual classroom you are required to use an identifiable name so the teacher can recognise you and mark you present. Aliases that do not contain your real name will result in a non-attendance mark for that session.

Virtual classroom access

Adobe Connect rooms allocated to the subjects you are enrolled in are open for tutorial times and lecture times. Recordings of lectures can be accessed anytime.

A separate meeting room for students to talk to each other and share work / help each other can be booked through your administration manager / student liaison officer.

Staff access

Teaching staff will be in the virtual classroom with you during the nominated tutorial times. Information about these times will be available online at your AIEPortal course page.

If the class is large an appropriate secondary teacher will be made available in the tutorial sessions to ensure each person gets help.

You can contact your teacher outside class times via emailing helponline@aie.edu.au . Please be aware that our industry focused staff at AIE often have other external projects and commitments and this may cause a delay in their response.

Appointments to talk to teachers out of class time can be requested and organised through your administration manager / student liaison officer.

Appointments to talk to your Head of School or Head of Department can be requested and organised through your administration manager / student liaison officer.

Public holidays

Public holidays map to Canberra public holidays. Holidays affecting your subjects will be indicated in the subject guide found in the course page on AIEPortal.

Online learning - AIEPortal

All information, updates and handouts relating to the course can be found on AIE's online learning environment. It can be found at -

<http://aieportal.aie.edu.au/>

A login letter with all log in details and links will be provided the week prior to the commencement of your course, sent to your specified email address. Please ensure that your email address is correct and current.

Ensure you have tested that your login works and that you can view information for the course you are enrolled in. Notify AIE immediately if you are having issues logging in, or accessing the correct course information, at: helponline@aie.edu.au

Access to subjects you are enrolled in will occur during the days leading up to the start of the subject.

Online learning - Connect

Connect is the virtual classroom you will be using to attend tutorials and lectures.

Links to the Connect rooms for lectures and tutorial sessions and recordings will be placed into the subject on AIEPortal.

You will need a head set or speakers and microphone to interact with your fellow students during Connect sessions.

The direct login page can be found at:

<http://onlineclasses.aie.edu.au/>

Your login details will arrive with the Portal login details and access to the tutorial rooms will only occur when a teacher is logged in. Lectures can be accessed anytime once they are recorded and linked through AIEPortal. Meeting rooms need to be booked in advance and will allow any student to enter while open.

Online learning - Perforce

Perforce is a software that is used to interact with AIE's version controlled assessment and group work file server. The client side software will be demonstrated and tutorials are made available via AIEPortal to ensure every student knows how to use it. You will be using this to store work in progress, submit assessments and work with fellow classmates on group projects.

Your link to the client download, server URL and login details will arrive with the Portal login details and access to the subjects you are enrolled into will occur in the days leading up to your subject beginning.

Text books

There are no specific required text books for the each subject, however your teacher will mention recommended books that will aid you in completing the Advanced Diploma of Professional Game Development.

Recommended equipment

Headphones and microphone will be required for you to listen to any audio in the class room and interact with the teacher and students effectively. A microphone will not always be used but is particularly useful for getting assistance and will be required for running presentations as part of some assessments.

General Information

Student Email

Please check your student email regularly as it will be used for announcements from admin and teachers. Your student email login details will be sent to you in your personal email prior to course commencement.

Software Requirements

Fortunately a selection of software used in all the courses are freely available for home usage.

Software that costs will be made available to students via AIE licencing where possible however there are some software we are not able to do this within the licencing agreements so some software will need to be purchased. This software is reasonably low in cost and needed at different times with in the course so not necessary to purchase right at the start of the course.

Details on software and any costs will be made available to you from your online course page on AIEPortal within your Subject guides and in the Study guide.

IT Support

If you are having trouble with your course software or log in for AIE resources you can ask your teacher in the tutorial session or email helponline@aie.edu.au which is monitored frequently.

Special requirements

If you have any special requirements (such as medical requirements) that are important for your study at AIE be sure to inform your teacher and AIE administration so we might provide the best learning experience we can.

Improvements from student and industry feedback

It is important to AIE that we deliver the highest quality courses in the best manner we can. To help us do this we seek comment and feedback from our students. We also seek feedback and advice from industry professionals. Listed here are the improvements we have made from the feedback previous students have given us and the feedback from industry. Your teacher will request feedback through the completion of surveys as well as informal discussions from you during the course.

Summary of improvements from feedback

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