Infocomm Club Programme

Course Modules

We offer a suite of interesting modules for secondary school students. The curriculum allows the students to specialize in either Digital Media or Game Development option after the Year 1 programme as shown in the table. You can refer to the enclosed detailed syllabus for more information.

Year 1 **Fun with Digital Media & Game Development**	
Year 2 **Digital Media** **Fun with 2D Animation**	**Game Development** **Game Development (Intermediate)**
Year 3 **Digital Media** **Fun with 3D Animation**	**Game Development** **Game Development (Advanced)**

Course Fee

The secondary school can opt to conduct the courses in its premise or in Singapore Polytechnic, subjected to availability of labs. We recommend conducting the Year 1 programme in the secondary school's premise and Year 2 and 3 programmes in Singapore Polytechnic. This will give the students an opportunity to visit our facilities to learn more about the different facets of Digital Media and IT as well as get a taste of polytechnic life. Another advantage is cost-savings for the school.

	Course conducted in Sec School	Course Conducted in Singapore Poly
Year 1/2/3	**$270/student** **Class size: 20**	**$360/student** **Class size: 20**

Year 1

Title of Module: Fun with Digital Media and Game Development

Objectives of Module: The programme provides students with a fundamental understanding of game development and digital media creation such as animation, webpage design and audio editing.

No. of Sessions Needed : 20 x 3 hrs each (60 hours total)

Resources Needed:
1. IE Explorer
2. One of the following: Frontpage, Dreamweaver or Notepad
3. Torque 5.2.1 game engine (Downloadable from http://www.garagegames.com/products/tge or purchase the text book 'Torque For Teens' by Michael Duggan, Cengage Learning)
4. Acid Xpress (Free software downloadable from www.acidplanet.com/download/xpress)
5. Microsoft Movie Maker (Window XP)
6. Web Camera
7. Plasticine

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
1	Overview of the Infocomm Industry	Understand the role of the Infocomm industry in relation to its economy. Understand Infocomm Adoption in the following areas: • Digital Media & Entertainment • Education • Financial Services • Healthcare • Manufacturing & Logistics • Tourism, Hospitality & Retail • Government • Small & Medium-Sized Enterprises • Community	Class discussion / research Class research on Infocomm careers on IDA website. Introduction to 3D Game Level Design using game engine.	Lecture / Tutorial / Practical

2	Historical Overview of Interactive Digital Games	Introduction to the history and evolution of computers and the Internet. Introduction to the history of video/computer games.	Analyse and discuss some historically significant games. Terrain modelling and texturing using a game engine.	Lecture / Tutorial / Practical
3-4	Genres & Platforms for Game Development and Distribution	Understand the types of game genres and platforms available for game development and distribution. Identify the current top 5 games and which platforms they are released on.	Lectures & Class discussions on overview of differences in consoles. Create a Sky Box & clouds using a game engine.	Lecture / Tutorial / Practical
5	Role of Modern Games in Society	Understand the cultural and social impact of modern games.	Discuss the social impact of games we play, and the cultural influences. Reference current news articles and events. Reflection on why players play games – for escapism, relief of stress or socialising. Create Water Blocks using a game engine.	Lectures / Tutorial / Practical
6-7	Introduction to the Technical Aspects of Game	Understand how the different disciplines work together in a game development company and the courses available for students in a polytechnic: • Game Design • Game Programming • Game Graphic, Animation and Audio Visual Design	Class discussion Students are to pick a role to play in a game development team scenario and pick a traditional physical board game to digitise. Create Sun & Sunlight in a game engine.	Lecture / Tutorial / Practical
8	Overview of Game Production	Learn about the game development process from conception to completion.	Discuss the transition to digital format and the value added to the original game identified in sessions 6-7. Create particle systems using a game engine.	Lecture / Tutorial / Practical

9	State of Local Game Industry	Introduction to the local game development companies and the digital media produced.	Mini-quiz for students to explore the following: • Where the company came from • When it was set up in Singapore • What games they produce Discover Shape Replicators in a game engine.	Tutorial / Practical
10	Visits / Guest Lecture	Know the current trend of the industry.	Site visit / Guest speaker	Lecture/ Demo
11	Introduction	The students will be briefed on the overview of the programme. The session introduces the brief history of animation and the range of traditional styles such as stop motion, cut paper, claymation etc.	Viewing of relevant movie clips	Lecture
12	Animated storyline	The students will learn the importance of a strong storyline supporting the animation. They will plan for the models and props needed for their story.	Group work to develop a storyline. They will produce a story script and list of props, materials needed.	Lecture ; Project work
13-14	Modelling and camera work	The students will learn to create models and props needed for the story they have developed.	Hands on activities to create models and props. Students will use art materials such as plasticine. They will take still shots of the models and props using the camera.	Lecture ; Project work
15	Create an animation clip	They will learn to import the shots into the Movie Maker Timeline.	Hands activities on computer and camera to produce their animated story.	Project work
16	Use audio software for recording and editing	They will learn to use Digital Audio Workstation (DAW) software to do simple recording and editing of audio	Hands on computer activities with microphones.	Project work
17	Use audio/video software for editing/playback	They will learn to use DAW software to export the audio file. The students will learn to import the audio file into the Movie Maker Timeline	Hands on computer activities.	Project work

18	Creating web pages using templates	- To learn basic HTML. - To make use of templates. - To create hyperlinks between pages. - To create and edit text and graphical content.	Sketching of Web Site Map. Guided Practical in Lab.	Lecture, Hands-on Practical.
19	Working with Multimedia Content	- To add Flash Movies to a web page. - To add Video to a web page. - To add Audio to a web page. - Set properties for Flash Movies, Video and Audio.	Guided Practical in Lab.	Lecture, Hands-on Practical.
20	Publishing on a web server	- To use a web server. - Adjust FTP settings. - Upload web sites to web server. - Test web sites which have been uploaded online.	Guided Practical in Lab.	Lecture, Hands-on Practical.

School of Digital Media and Infocomm Technology, Singapore Polytechnic

Digital Media Option

Year 2

Title of Module: Fun with 2D Animation

Objectives of Module: This module aims to introduce students to the basic concepts involved in 2D animation using professional digital tools. It allows students to produce their work entirely digitally and minimizes the need for paper and other traditional materials. This module introduces the fundamental techniques and terminology of classical animation such as timing and spacing, and enables the students to apply these concepts in the production of 2d animation within the digital realm.

No. of Sessions Needed: 20 x 3 hrs each (60 hours total)

Resources Needed:
1. TAB (version 3.0) 2D animation software program.
2. Wacom Graphic Pen Tablet.

NOTE: You can choose to conduct this course in Singapore Polytechnic if resource is available.

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
1	Introduction to animation & showcase	The students will be briefed on the overview of the programme. The session introduces the brief history of animation and showcases a range of traditional animation.	Brief on tradition animation and viewing of relevant movie clips	Lecture
2	Introduction to Tab animation: Drawing, colouring and transformation.	Students will be briefed on the overview of the Tab animation program. The session introduces the general interface & tools such as drawing, colouring & editing of objects in the work area using tools and styles.	Hands on activities on Tab animation program. Learning how to draw and transform objects drawn.	Practicing the software & input device.
3-9	Learn to create a simple animation	Students will learn how to create animations and the concept of frame by frame, roto-scoping, cloning and exploring the use of onion skin.	Hands on activities using Tab to create different objects, characters and backgrounds	Lecture ; Project work
10	Applying the	Students will learn the principles of animation	Hands on activities using Tab to apply	Lecture ; Project work

	principles of animations and integrating of sounds	through lectures and practice. Students will learn to combine animation with sounds.	the principles of animation.	
11-15	Animation project: Storyline, concept art & Storyboard	Students will learn the importance of a strong storyline & supporting visuals (characters, props and sets) for the animation. Students will learn to create storyboard needed for the story they have developed.	Hands on activities using Tab to develop a storyline. They will produce a simple story script, visual and storyboard needed.	Lecture ; Project work
16-18	Animation project: Production	Students will be producing their 2D animation.	Hands on activities using Tab to produce their animated story using Tab animation program.	Project work
19	Animation project: Integrating sounds into the finalised animation	Students will combine with sounds and output their animation.	Hands on activities using Tab to produce their animated story.	Lecture ; Project work
20	Showcase and critique	Students will present their production and a critique session will conducted for classmates to feedback on their work.	Movie viewing and critique	Lecture ; Project work

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Digital Media Option

Year 3

Title of Module: Fun with 3D Animation

Objectives of Module: This module aims to provide students with an overall knowledge of the techniques and tools for creating computer animation. This module covers the basic principles of classical animation which deal with the concepts of motion, transformation and timing.

No. of Sessions Needed: 20 x 3 hrs each (60 hours total)

Resources Needed:
3D Studio Max on multimedia PC

NOTE: You can choose to conduct this course in Singapore Polytechnic if resource is available.

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
1	Overview of Computer Animation	The students will learn the areas of computer animation. They will learn the steps involved in producing an animated short.	Screening of clips	Lecture
2	12 Principles of Animation	The students will learn the 12 Principles of animation. They will be introduced underlying concepts involved in animation such as timing and keyframe.	Screening of clips. Hands on using software.	Lecture
3-4	Story Development	The students will learn the process of story and character development. They will work in groups to develop a story for later production.	Screening of clips	Lecture ; Project work
5	Storyboarding	The students will learn to create storyboards using sketches to translate their story ideas into visual form.	Create storyboards	Lecture ; Project work
6	Presentation	Students will present their story using the storyboards they have created.	Presentation	Project work
7	Hierarchies and Groups	The students will learn to use groups and hierarchies for efficient animation.	Hands on using software.	Lecture ; Project work

8-9	Keyframe	The students will learn the importance of keyframes in animation. They will learn to create and edit keyframes in the software.	Hands on using software.	Lecture ; Project work
10	Animating materials	The students will learn to animate the materials that are mapped onto the objects. They will learn to adjust keyframes to achieve efficient animation.	Hands on using software.	Lecture ; Project work
11	Cameras and Lighting	The students will learn to use camera and lights to stage scenes effectively for an animation.	Hands on using software.	Lecture ; Project work
12	Visual Effects	Students will learn to enhance their projects using visual effects in the software. They will learn techniques to stimulate real-life phenomenon such as fog and atmospheric effects.	Hands on using software.	Lecture ; Project work
13-19	Project Work	Students will work in groups to produce their animated shorts: - Create additional models - Materials mapping - Lighting and camera - Animating scene	Hands on using software.	Project work
20	Showcase	Students will present and showcase their work.	Hands on using software.	Project work

Game Development Option

Year 2

Title of Module: Game Development (Intermediate)

Objectives of Module: The programme provides students with the knowledge of using a game engine to produce a navigable 3D virtual environment from the beginning and to learn simple scripting used in the game engine.

No. of Sessions Needed: 20 x 3 hrs each (60 hours total)

Resources Needed:
1. PC (bundled with Windows OS)
2. Panda3D software
3. Python Editor software
4. Autodesk 3ds Max 2010
5. Adobe Photoshop CS4

NOTE: You may choose to conduct this course in Singapore Polytechnic if resource is available.

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
1	Introduction to Game Engine	Understand the usage of Game Engine. Illustrate the difference between proprietary and open source Game Engines. List the advantages and disadvantages in using Game Engine.	Class discussion / research	Tutorial
2 - 4	Scripting Language	Understand the usage of Scripting Language. Understand the various standard terms used in Scripting Languages.	Hands-on practise	Tutorial

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
		List the various available Game Engines and their related Scripting Languages used.		
5	Game Level Design	Understand the design and various components of a Game Level: - Modeling - Objects - Texture - Motion - Scenes - Shaders - Camera - Lighting Define the term frame rate and how it relates to flow of a game.	Hands-on practise	Tutorial
6 – 8	Models, Objects, Characters	Understand the concept of creating a 3D model using bones and skeleton structuring. Learn to do simple 3D modeling of objects and characters using a 3D modeling tool. Understand how to use the models and objects created and place it into the 3D game engine.	Hands-on practise	Tutorial
9 - 11	Texture	Learn to create texturing for the objects and characters using Adobe Photoshop. Apply the texture created on objects and characters that are used in the	Hands-on practise	Tutorial

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
		3D game engine.		
12	Animation and Motion	Understand the terms animation and motion and the types of animation. Understand how bones in character models are used to create motion for characters. Demonstrate the ability to configure and make simple character motion.	Hands-on practise	Tutorial
13	Camera, Lights, Action! (I)	Know the importance of camera placement in game and the different views of the camera: - First Person View - Third Person View Demonstrate the ability to change the camera position in a 3D environment and allow user to navigate through the environment.	Hands-on practise	Tutorial
14	Camera, Lights, Action! (II)	Recognise the different settings of light used in game to create different moods, ambience, and atmosphere. Understand interactivity in game and how to handle interactivity through events, triggers, and actions.	Hands-on practise	Tutorial
16	Making a Scene	Know the makings of a game backdrop and create a scene in the game engine based on a certain theme.	Hands-on practise	Tutorial

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
		Apply fog and alpha to create a more realistic 3D environment.		
17 - 18	Collision Detection	Learn the importance and purpose of collision behaviour for objects and characters in the game. List examples or cases in games where collision is not handled properly. Illustrate the types of collision behaviour for objects and character and apply simple collision for objects using scripts.	Hands-on practise	Tutorial
19	Review	Explore the aesthetic placement and usage of the various models, characters, and scenes in the game engine. Review and navigate through the 3D environment.	Hands-on practise	Tutorial
20	Presentation	Explore the game engines that are used in the current game industry. Students to present to class on the game design that they have done over the past lessons.	Class Presentation	Tutorial

Game Development Option

Year 3

Title of Module: Game Development (Advanced)

Objectives of Module: The programme provides students with the knowledge of using a game engine and its scripting language to produce a playable 3D game with physics and artificial intelligence in place.

No. of Sessions Needed: 20 x 3 hrs each (60 hours total)

Resources Needed:
1. PC (bundled with Windows OS)
2. Panda3D software
3. Python Editor software
4. Autodesk 3ds Max 2010
5. Adobe Photoshop CS4

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
1 - 2	Introduction to Game Engine and Game Level Design	Understand the usage of Game Engine. Illustrate the difference between proprietary and open source Game Engines. Understand the design and various components of a Game Level: - Modeling - Objects - Texture - Motion - Scenes - Shaders - Camera - Lighting	Class discussion / research Hands-on practise	Tutorial

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
3 - 4	Scripting Language	Understand the usage of Scripting Language. Understand the various standard terms used in Scripting Languages. List the various available Game Engines and their related Scripting Languages used.	Hands-on practise	Tutorial
5 - 6	Controlling Your Character in Game	Illustrate the main control types for character movement: mouse and keyboard. Apply and show the ability to control character movement in a 3D environment using scripting.	Hands-on practise	Tutorial
7 - 8	Picking Up Items	Identify the types of items that a player can pick up in a 3D game environment. Understand how the items are used or stored when picked up by player. Using scripts to allow player to pick up multiple items in the 3D environment.	Hands-on practise	Tutorial
9 - 10	Actors in Game	Know the different types of characters in game: non player characters and player characters. Using motion path to control the movement or interactivity for the different types of characters in game.	Hands-on practise	Tutorial

Session	Topic	Specific Objectives	Activities	Format (Lecture, Tutorial or Project Work)
11 - 14	Artificial Intelligence	Explore the various aspects of artificial intelligence in the game environment: - Finite State Machines - Chasing/Evading - Path-finding Apply artificial intelligence in game environment using scripts.	Hands-on practise	Tutorial
15 - 17	Physics	Learn the usage of physics in a virtual environment and how it is applied in games. - Velocity / acceleration - Gravity - Projectiles Apply physics to certain game elements using scripts.	Hands-on practise	Tutorial
18	Sound	Identify the different types of sound effects. Implement sound effects and background music into the game environment.	Hands-on practise	Tutorial
19	Review	Review and navigate through the 3D environment. Perform play-testing and debugging of game created.	Hands-on practise	Tutorial
20	Presentation	Explore the game engines that are used in the current game industry. Students to present to class on the game design that they have done over the past lessons.	Class Presentation	Tutorial