

## ***BA DigiPen Academy – 12A***

**District Name: Kamloops/North Thompson**

**District Number: 73**

**Developed by: Justin deVries**

**Date Developed: Spring 2012**

**School Name: Sa-Hali Secondary School**

**Principal's Name: Richard Kienlein**

**Board/Authority Approval Date:**

**Board/Authority Signature:**

**Course Name: BA Digipen Technical Academy 12A**

**Grade Level Course: Grade 12**

**Number of Course Credits: 4**

**Number of Hours of Instruction: 120**

**Prerequisite(s) recommended:**

- Principals of Math 10
- Principals of Math 11 (or concurrent)
- Physics 11 (concurrent)
- Art course(s)

**Special Training, Facilities or Equipment Required:**

Computer Science background, or experience in similar area along with training provided by DigiPen Institute of Technology. Facilities should include a computer lab with recent model computer, with video card and a large amount of memory. Video projector, DigiPen training software (proprietary game development tools), graphics programs for 2D and 3D graphics (preferably PhotoShop CS3, 3D StudioMax). Printed support materials (workbooks, etc) are provided by DigiPen ó students retain their workbooks.

## **Course Synopsis**

This course is the first of four courses that make up the DigiPen Academy Program. The DigiPen ProjectFUN Computer Science Technology Program is a project-based curriculum targeted at high school students that leverages interest in video game development as a learning vehicle. The program is essentially a computer science course made up of seven modules, each with a unique game that students will produce. In addition to teaching computer science, the material also covers topics in mathematics and production art.

This course introduces some basic ideas and tools from computer science and mathematics as used in game programming. These tools will be used in later sections of the course to build new games.

### **Rationale:**

Vancouver is rapidly attracting a concentration of video game production companies. Employment and compensation opportunities provided in this industry are among the fastest growing in Canada's knowledge-based economy. This program will provide our students with an opportunity to participate in the curriculum of an internationally recognized video game university (DigiPen), while gaining experience with real-world video game creation. Students will also acquire the knowledge and skills to enable them to become successful candidates for other roles within the industry. Students will be able to draw on a cross-curricular knowledge and skills from disciplines such as Mathematics, Physics, Music and Art.

This course is one of four and will engage the first 2 of 7 modules in the program. The course offers an introduction to real time interactive simulation, motion picture and game elements, and covers computer architecture, and an overview of C programming language. Module 2 expands on C/C++ programming languages, Math functions, and Art concepts.

## Organizational Structure

The nature of this course doesn't lend itself to a structured unit-by-unit outline. However, the following table lists the topics and approximate percentage of time spent on these tasks:

Topic	Title	Time
Module 1 ó "The Cage"		60 hours
Computer Science	Introduction	
	Numbers	
	Logic Gates	
	Languages	
Mathematics	Trigonometry (functions, identities)	
Production Art	Art for Games	
	Art and Design Elements	
Module 2 ó "Base Maze"		60 hours
Computer Science	C types	
	Variables	
	Expressions, statements, operators (logic)	
	Flow control	
	Functions	
	Input and Output	
Mathematics	Integers	
	Fractions	
	Functions	
Production Art	Art and Design Principles	

## Unit Topic Module Descriptions

Module 1: The Cage ó In this module students are introduced to their first "simulation" called "The Cage"

### Computer Science

*It is expected students will:*

- Cover topics of real-time interactive simulation, motion picture and game elements
- Acquire an understanding of a brief history of the evolution of computers
- Understand computer architecture, explaining some basic concepts as numbers and logic gates.
- Acquire an overview of the C language.

## Mathematics:

*It is expected students will:*

- Gain an understanding of the importance of Trigonometry in Math and its use in computer programming and game development.
- Encounter the basics of trigonometry such as trigonometric functions and formulas which will be used in later modules.

## Production Art

*It is expected students will:*

- Use art for games, including: art elements and tools as well as art and design elements such as lines and shapes, forms and space, texture, value and colour.

## Module 2: øBase Mazeø

In module 2, a new game is introduced called øBase Mazeø. This game is a console game where you can move the main character -Pø within a grid using commands as -L for left, R for right, U for up and D for down. The aim is to lead the character to the base avoiding the enemies all the way. Each enemy has a movement pattern. You have to figure out these patterns to escape the enemies and reach the base.

## Computer Science

*It is expected students will:*

- Use C/C++ language basics, such as types, declaring and defining variables, expressions and operators
- Use functions, flow control statements and the input/output functions associated with C/C++.

## Mathematics

*It is expected students will:*

- Understand the use of numbers, including divisibility, least common multiples and greatest common divisors, and about division and its properties. These are basics and students will enjoy their application through all modules once understood.
- Understand the definition of functions, their use and properties
- Be able to discuss the most common functions and their characteristics. A thorough knowledge of functions is essential in math, and especially in game design.

## Production Art

*It is expected students will:*

- Continue their development of art design principles: balance, emphasis, contrast, movement, rhythm, pattern, variety and unity.

## Instructional Components

- Direct instruction
- Indirect instruction
- Interactive instruction
- Independent, guided practice
- Modeling
- Group work ó principal component in assessment

## Student Expectations

- Ability to work cooperatively
- High level of classroom maturity
- Leadership and ability to lead discussions and present material
- Solid Math and communication skills
- Basic knowledge of computer operation

## Learning Resources

- Printed materials: *DigiPen Tech Academy: Modules 1 & 2*
- Computer Lab
- Video projector
- Software

## Student Fees

- \$150/year

## Assessment

Topic	Title	Value
Module 1 ó -The Cageø		
Computer Science	Introduction	5%
	Numbers	5%
	Logic Gates	5%
	Languages	5%
Mathematics	Trigonometry (functions, identities)	5%
Production Art	Art for Games	5%
	Art and Design Elements	5%
Module 2 ó -Base Mazeø		
Computer Science	C types	5%
	Variables	5%
	Expressions, statements, operators (logic)	5%
	Flow control	10%
	Functions	10%
	Input and Output	10%
Mathematics	Integers	5%
	Fractions	5%
	Functions	5%
Production Art	Art and Design Principles	5%
	Total	100%

Assessments will be both formative and summative and consist of conversations, group presentations, concept quizzes, class work, projects, and a final assessment piece.