Vanier College
Faculty of Science and Technology
Computer Science Department

Course Number	420-141-VA	**Teacher**	Mohand Chebbine
Course Title	Game Programming 1	**E-mail**	through MIO
Section	00001 & 00002	**Office Hours**	by appointment
Ponderation	Theory: 2, Lab: 3, Homework: 2	**Semester**	Fall 2020

COURSE DESCRIPTION

This is an introductory project-based course where students will produce an original video game. This course introduces students to *Greenfoot* software, a basic game engine, that will be used to build a variety of interactive games. The course is designed to learn programming and to collaborate in team projects as well as application of mathematical concepts. Students will be encouraged to think creatively, reason systematically and work collaboratively in order to implement an original game to be presented to their peers at the end of the semester.

In addition to computer programming concepts, students will learn different aspects of video game development including basic image editing, animation, working with sounds, visual effects, etc. This course does not assume any previous programming knowledge.

LEARNING OUTCOMES

At the end of the course, students will be able to do the following:

- Programming using a basic game engine
- Using mathematics in the implementation of game scenarios
- Integrating and editing game assets (images/sounds/animations)
- Producing a simplified Game Design Document
- Collaborating on a programming project using Source Control
- Delivering a presentation

STATEMENT OF COMPETENCY

00SW Develop gaming or simulation applications

Elements of Competency

1. Analyze the application development project
2. Prepare the computer development environment
3. Generate real or virtual world representations
4. Program the game or simulation logic
5. Produce the documentation

COURSE TOPICS

- Introduction to game world
- Introduction to Greenfoot, classes, methods, data types, sub-/super-classes, method calls, writing code
- Logic structures, math operations, class methods, commenting code, API documentation, random behavior, keyboard controls
- Conditional statements, variables, class constructors, reference variables
- Basics of sound, loops, Arrays, logical operators, strings
- Creating sounds and pictures, how color is created & perceived, mouse input
- Introduction to Game Design Document (GDD)
- Introduction to Version Control Systems
- Simulation Application: imitating some phenomena from real life
- Selected topics in Java and algorithmic thinking to support the final project
- Sharing and collaboration

TEACHING METHODS

Course content will be delivered entirely online and asynchronously. Pre-recorded video segments will be posted on **Léa.**

In addition, there will be weekly synchronous meeting(s) at the scheduled class time on **Léa/Zoom**. Considering that some students might share a computer with family members and might not be available for remote work at specific times, participation is not mandatory. Nevertheless, students are encouraged to participate in those meetings which are closer to the live interaction provided in presential classes.

Synchronous meetings can last up to an hour as long as there are discussions or questions from students. Students can send questions in advance via MIO, and even if the author is not online, the question will be presented (anonymously, if preferred) and answered live.

WEEKLY SCHEDULE

Here is how a typical week will look like:

- Lectures will be pre-recorded and uploaded to **Léa**.
- Labs will be posted on **Léa**.
- The first weekly live meeting (via **Léa/Zoom**) will happen on:
    - Monday @ 13:00 (sect. 00001)
    - Tuesday @ 13:00 (sect. 00002)
- All deliverables for the week will be due on Friday @ 23:59, unless specified otherwise.

TEXTBOOK (RECOMMENDED)

Introduction to Programming with Greenfoot: Object-Oriented Programming in Java with Games and Simulations, 2nd Edition.

Author: Michael Kolling

Publisher: Pearson

ISBN-13: 9780134054292

Approximate price: ~$ 120

Web Link: http://www.mypearsonstore.com/bookstore/introduction-to-programming-with-greenfoot-object-oriented-9780134054292?xid=PSED

SOFTWARE TO USE

Greenfoot will be used to learn the general fundamentals and principles of programming by creating your very own interesting games and simulations.

The following Software will be used and each of them is free to download/install:
   1) **Greenfoot** (for game programming)
   2) **Gimp** (for image editing)
   3) **Audacity** (for audio editing)

EVALUATION PROCEDURES AND GRADING SCHEME

Labs:	30 % (all labs have equal weight)
Exam 1:	20 % (~ Week 6)
Exam 2:	20 % (~ Week 12)
Team Project:	30 %

- To pass the course, students must **obtain an average of 60% both overall and on the exams**. If the average of the two exams is below 60%, the final mark for the course will be this average.
- Late submission of Assignments: **10% per day will be deducted from late assignments**. Assignments more than three days late will not be accepted.
- Midterm statement of progress: the college's midterm assessment procedure will be used to provide feedback to the students.

TEAM PROJECT

Teams of 2 or 3 students will design and produce a video game using techniques covered in this course. At the end of the term, each team will deliver a report, give a presentation and demonstrate its final project to the teacher and other students.

The project will be graded on form, content and delivery. Instructions and technical requirements of the game will be provided later through **Léa**.

GENERAL ACADEMIC POLICIES

It is the student's responsibility to be familiar with and adhere to all Vanier College Policies. A summary of the course-level policies that apply in this and all other Vanier courses can be found under Course-Level Policies in Important Vanier Links on Omnivox. Complete policies can be found on the Vanier College website, under Policies. Your attention is drawn in particular to the following policies: policies on academic complaints; cheating and plagiarism; religious holy day absences; student misconduct in the classroom; and, student rights and responsibilities (section 3.1) in IPESA document.

WEEKLY PLAN

(Please see next page)

Weekly Plan

Week #	Lecture Topics	Lab Activities
1	Syllabus Introductions to Game World	Greenfoot Software Installation
2	Ch. 1: Introduction to Greenfoot, classes, methods, data types	Lab (Ch. 1): Greenfoot overview
3	Ch. 2: More about classes, sub-/super-classes, method calls, writing code	Lab (Ch. 2): First program: Little Crab Game
4	Ch. 3: Logic structures, math operations, class methods, commenting code, API documentation, random behavior, keyboard controls	Lab (Ch. 3): Improving the Little Crab game
5	Ch. 4: Conditional statements, variables, class constructors, reference variables	Lab (Ch. 4): Finishing the Little Crab game
6	**Exam #1**	Provide course project instructions to students
7	Ch. 6 - part I: Loops	Lab (Loops)
8	Ch. 6 - part II: Arrays, logical operators, strings	Lab (Arrays)
9	Ch. 10 (part I) Editing pictures Graphic modes (Victor, Bitmap)	Installation and use of *Gimp* Software
10	Ch. 10 (part II) Creating and editing sounds	Installation and use of **Audacity** Software
11	Git and Github	Create **Github** user account Configure **Git** to access Github
12	**Exam #2**	
13	Ch. 11: Simulation Application: imitating some phenomena from real life	Work on course project
14	Selected topics in Java and algorithmic thinking to support the final project	Work on course project
15	Course Project Presentation	