Mini-Courses 2015 – Program week May 4 to 8, 2015

http://carleton.ca/emcp/

201 - Teach your Computer to Paint

ABSTRACT:
This is a course that can be taken by anyone with an interest in art or an interest in computers. In this course, we will learn how to make digital drawings, paintings and animations by programming within the "processing" environment. "Processing" is an interactive system especially created for digital artists—artists can work inside it to get some computer help in making animations, graphics, and even artificial life. The course will include lots of hands-on practice where participants can experiment with making their own computer art and animations.

Instructor: Jason Hinek
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: 4155HP and (RB1201, TB219)

202 - Animation with Processing

ABSTRACT:
In this course we will learn how to make 2D and 3D digital animations using the "processing" programming environment. "Processing" is a programming system specifically designed for digital artists. Utilizing computer programming principles to make animations, graphics and even depict artificial life. This course will cover an introduction to computer animation principles while emphasizing artistic and aesthetic creativity. Some times will be spent discovering other sources for animation such as internationally acclaimed animation competition winners for inspiration. These will also showcase a variety of techniques and styles that could be incorporated into the student's own project. This is a course that can be taken by anyone with an interest in making their own computer animations. This course will explore a variety of math activities selected from such topics as: the nature of infinity, the mysterious properties of prime numbers, constructing geometrical objects, the mathematical art of Escher, the math behind random events (including casinos, lotteries and card games), paradoxes and problem-solving (both in math and in non-mathematical life).

Instructor: ~~Ann Fry~~ combined with Jason Hinek course
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: 4155HP

204 - Computer Science and Games: Just for GIRLS!

ABSTRACT:
Are you a girl that has ever wondered what computer science was all about, but has been too afraid to ask? Whether you are 'geeky' or the opposite, this is your chance to learn about computer science, and to see how it is involved in the design and development of video games. After taking a quick look at the state of the industry and how women are involved, we will cover such topics as game design, usability, graphics, and artificial intelligence. Best of all, you will get to work on making your own game to take home at the end of the week! Not to worry; you won't even need to write a single line of code if you don't want to!

Instructor: Gail Carmichael
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: 4115HP

205 - Can you imagine? 12 + 21 = 00001100 + 00010101

ABSTRACT:
Today almost everyone uses computer-based applications. Consider the mobile device that you use everyday to read online articles, news, etc. Most of us use these devices without even understanding what is happening in the background, or how data is being processed.

In this mini-course, we will learn how data is stored and processed in an electronic device, e.g., computer or mobile. For example, we will learn and understand how these devices do simple computation like 12+21.

There are different levels of data representation and we will learn how to write a very simple program in C or C++ language—the basic language for many computer-based applications.

Instructor: Ahmad Biniaz
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: LA B241 (and 3341HP)

206 - The Recipe for Entertainment: Computer Science and Video Games

ABSTRACT:
Ever wonder how those video games you love are made? This is your opportunity to learn about Computer Science through one of its most popular aspects: video games! We'll discuss topics such as game design, graphics, artificial intelligence, the state of the industry, the history of games, and generally what makes games good! We are going in-depth to show you what is involved in the creation of video games. The best part of it all is that you will get to design and create your own video game to take home with you!

Instructor: Jiayu Li and Gregory Twentyman
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: 5151HP

209 - Short Circuit

ABSTRACT:
IMPORTANT: BEFORE YOU REGISTER FOR THIS COURSE, PLEASE BE AWARE THAT AN ADDITIONAL $82 FOR COURSE MATERIAL IS REQUIRED.

The course name is inspired by the movie "Short Circuit". This course will take you through the steps on how to interact a hardware using software. Indeed you will learn the basics which can help you to create your own robot but the course is more software oriented as for the hardware part you just have to assemble the ready-made products. Thus, the goal of this course is to teach students basics of programing languages while interacting with hardware.

What makes this course interesting is the simplicity of the hardware setup and utterly simple use of a low level programming language.

The requirements for this course:
1. Arduino Uno- R3
2. A computer to write the code and transfer it to Arduino.
3. Few Arduino shields.

What is Arduino

Arduino is an open-source hardware, something between LEGO Technic and a low level circuit building. It requires very basic C programming skills (which will be covered in this course). No memory allocation, no call by reference and so on. For this course, you only need to learn conditions, loops, functions, arrays and how to use libraries. No knowledge of electronic circuits required, as we will use shield extensions, which you can add them on top of each other. There are numerous shields available in the market. The only limit here is your imagination.

Mini-Course Outline
Although this seems to be overly complicated, thanks to today's technology, the outline is surprisingly simple. We believe that the learning curve should be even shorter due to its practical nature. To just give an idea of how far this course will go; here is one of the projects: LED matrix.

Instructor: Abdolriza Shirvani
School or Department: Computer Science
Grades: Min: 8 - Max: 11
Location: 3115HP