# COSC 123 – Computer Creativity
## Winter 2019 – Term 2

**UBC OKANAGAN**

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| **Instructor:** | Dr. Abdallah Mohamed | | | |

**Class time/location:** M/W/F    **11:30-12:30**    **ART-114**

**Lab time/location:**
L01 Fri   13:30 15:30   ASC-165   TA: Nathania Hendradjaja
L03 Thu   11:00 13:00   ART-215   TA: Pinku Nath
L04 Mon   14:30 16:30   ART-215   TA: Tenzin Jinpa

**Office hours/location:** **Mon**: 10:30-11:20, **Tue**: 12:30-14:00, **Thu**: 14:30-15:20, or by appointment at **SCI 108**

**E-mail:** *Instructor*: **abdallah.mohamed@ubc.ca (preferred contact method)**
*TAs:* use the hyperlinks above.

**Phone:** (250) 807-8247

**Course Website:**
- Canvas
- https://people.ok.ubc.ca/abdalmoh/teaching/123

## Course Description

**Official Calendar Description:** A hands-on introduction to programming and computer-based problem solving and creativity. Experience with application development including storytelling, graphics, games, and networking.

**Specific description**: The goal of this course is to give students a creative introduction to programming. Students learn programming basics such as decisions, iteration, objects, methods, and classes through the Processing language. Near the end of the semester, the course transitions to Java language to allow for building larger programs. Students will explore events, graphics, animation, 2D gaming, and file manipulation while practicing programming concepts. Programming is performed in pairs to encourage collaboration and understanding. Some lectures require finishing a pre-class reading or assignment which will give more time for in-class practices. Students completing this course will understand programming fundamentals, have created interesting and fun programs and animations, and have the ability to continue in following computer science courses.

## Prerequisites: COSC 111 or COSC 122.

## Assessment

- ❖ In-class quizzes and questions   **20 %**    (10% on clickers + 10% on programming exercise)
- ❖ Lab Assignments   **20 %**
- ❖ Two Midterm Exams   **10 % - 30%**    (75 minutes each, in class, midterms have equal weights)
- ❖ Final Exam   **30 % - 50%**    (cumulative, three hours)

Midterms are used to improve your mark and prepare you for the final, not to penalize you. There is 60% of the course grade for all exams. The exams mark is calculated **based on the best** of the following options:

| | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| Midterm 1 | 15 % | 15 % | 5 % | 5 % |
| Midterm 2 | 15 % | 5 % | 15 % | 5 % |
| Final | 30 % | 40 % | 40 % | 50 % |

**In order to pass the course, a student must receive: (1) an overall course grade of at least 50%, and (2) a combined grade of at least 50% on the exams (midterms and final). Otherwise, the student will be assigned a maximum mark of 45.** All exams (midterms and final) are paper-based, closed-book exams. No course materials, calculators, cell phones, or other electronic devices are allowed during the exam time.

If you have any complaint related to this course, e.g., you feel your mark was unfair or incorrectly recorded, **please ensure that I am aware of the problem as soon as possible. All complaints about marks, except about that of the final exam, must be registered with me before the scheduled date of the final examination.** If any complaint is not resolved to your satisfaction, you should go the unit Head.

## Missed Exams and Late Assignments

**Missed exams:** If a student misses an exam without acceptable excuse according the UBC Okanagan's policy on excused absences from examinations, the mark received will be zero. If an acceptable excuse is provided to the instructor, then for:

❖ Midterm exams, the grade will be combined with the marks of the final exam so that the exams are still worth 60 % of the total grade.

❖ Final exams, the student may retake a make-up final exam with the permission of the Dean's office. Note that a make-up exam may have a question format different from the regular exam.

**Late assignments:** Except for extreme situations (e.g., illness, childbirth, or bereavement supported by a written proof such as a doctor's note), the following penalty policy will be applied to late assignments:

❖ 0 to 24 hours late: 25% mark deduction (e.g., if an assignment is worth 20 marks, then 5 marks will be deducted from the assignment mark; no negative marks will be given.).

❖ 24 to 48 hours late: 50% mark deduction

❖ More than 48 hours: no mark.

**Late classroom exercises**: no late submissions will be accepted (unless you have an acceptable excuse).

## Expectations

**It is my best day when all my students pass the course, receive good grades, and feel the course was useful. For that to happen, help me by putting enough effort for the course.** I expect that you will attend all classes and participate in class discussions, read the lecture notes **before** the lecture, attend all labs, finish all your assignments on time, and practice on the course materials. I also expect that you will spend (in average) around six hours per week in out-of-class relevant activities (homework, preparation, practicing, etc).

## Textbook and Reference Materials

❖ Course website and discussion forum on Blackboard Connect

❖ Lecture Notes (available electronically).

❖ Textbooks:

- Daniel Shiffman, Learning Processing: A Beginner's Guide to Programming Images, Animation, and Interaction, 2nd Edition, ISBN: 0123944430. Textbook website with exercises and video tutorials at www.learningprocessing.com.
- Casey Reas and Ben Fry, Processing: A Programming Handbook for Visual Designers, 2nd Edition, ISBN: 026202828X

❖ Other Helpful Resources:

- Official Processing website: processing.org
  - Language reference: processing.org/reference
  - Many online tutorials: processing.org/tutorials
- Learning Processing website: learningprocessing.com
- More tutorials and examples: openprocessing.org and funprogramming.org
- (*Java*): D. J. Eck, Introduction to Programming Using Java, 6th Ed, available at: math.hws.edu/javanotes

❖ Clicker (required!).

## Course Discussion Forum

The course discussion forum is used for exchanging ideas, asking questions, and receiving answers related to the course from other students. If you don't understand something, you may ask on the forum so that everyone can benefit from the answer. If you are not clear about an answer that was given, don't create a new thread. Just add a reply to the original thread asking for clarification.

In all cases, respectful and academic atmosphere must be maintained. You should not post private information on the discussion forum. You must not share answers to assignments with anyone, on the forum or anywhere else.

## Class Format

This course uses **partially flipped classroom mode**. For select lectures, students are expected to go over some course materials in advance, and class time will be used mainly for practical learning by writing code using pair programming technique. For this to work, **students must come prepared to class**.

Class attendance and taking notes are expected, and students are responsible for all course material as indicated in class. You are also expected to respect the other members of the class as well as the instructor. Inappropriate class behavior is not allowed (e.g., talking on cell phones, engaging in non-class activities, sleeping, use disrespectful language, etc.). To encourage attendance and effort, 20% of your overall grade is allocated to answering questions in class. There are two types of questions:

❖ **Electronic questions answered using clickers (10%):** There will be at many questions asked during lectures. In addition, whenever there is pre-class work, the lecture will start with clicker questions to assess your understanding of the pre-class materials. You need to correctly answer at least 80% of all questions to get the full mark for this part **You must be present with your clicker to get your answers counted.**

❖ **Programming and written questions (10%):** There will be about many programming and written questions. They should be finished in teams (pairs). **You should plan and work ahead as not all questions will be given sufficient time to complete during class time.**

## Communication

Email is the best way of communication; you can use my email above. You can also see me outside the office hours if my door is open and I have time to meet with you. However, to guarantee I can spend time with you, email for an appointment. For a prompt response, **put your course number and name in the subject of the email** (i.e., COSC122-YourName: subject).

## Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. **For example, incidences of plagiarism or cheating usually result in a failing grade or mark of zero on the assignment or in the course.** Careful records are kept to monitor and prevent recidivism. A more detailed description of academic integrity, including the policies and procedures, may be found at http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,54,111,959. **If you have any questions about how academic integrity applies to this course, consult with the instructor.**

## Disability Services

If you require disability-related accommodations to meet the course objectives, please contact the Coordinator of Disability Resources located in the Student Development and Advising area of the student services building. For more information about Disability Resources or academic accommodations, please visit the website at http://you.ubc.ca/ubc-life/support/students-disabilities/ok/

## Ombuds Office

The Ombuds Office offers independent, impartial, and confidential support to students in navigating UBC policies, processes, and resources, as well as guidance in resolving concerns related to fairness.

**UBC Okanagan Ombuds Office:**
**UNC 227B** 250.807.9818
email: *ombuds.office.ok@ubc.ca*
Web: http://ombudsoffice.ubc.ca/ubc-okanagan-2

## Equity and Inclusion

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from discrimination and harassment. UBC prohibits discrimination and harassment on the basis of the following grounds: age, ancestry, colour, family status, marital status, physical or mental disability, place of origin, political belief, race, religion, sex, sexual orientation or unrelated criminal conviction. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity and Inclusion Office.

**UBC Okanagan Equity and Inclusion Office:**
**UNC 227C** 250.807.9291
email: *equity.ubco@ubc.ca*
Web: www.ubc.ca/okanagan/equity

## Student Learning Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies. For more information, please visit the Hub's website at students.ok.ubc.ca/hub or call 250-807-9185.

## Important Dates

http://www.calendar.ubc.ca/okanagan

## Tentative Schedule

**LECTURES:** An outline of lecture times, course topics, and exam dates is given below. The professor is not bound to the timeline provided, i.e. the dates and topics are subject to change. Any such change will be announced to students.

**LAB WORK**: An outline is given below. In every lab, you will be given an assignment. The due date of assignments is usually after one week at 11:59 pm. All lab assignments are done using the ***pair-programming approach***.  Students will select a partner at the start of class that will be their partner for the duration of the course.  Students may ask the professor for help in finding a suitable partner. Accommodation is made for students whose partner leaves the course before its completion.  Some of assignments are dedicated to a multi-week project.  This multi-week project allows students to explore their creativity with the concepts learned.  Students will be provided with the necessary starter code and instruction to help with the creation of these projects.

| W | Date | Topic | Lab Assignments |
|---|------|-------|-----------------|
| w1 | Mon, Jan 6 | Intro to course/Processing. Select programming pairs. | No labs during first two weeks of class. |
| | Wed, Jan 8 | Software Development, Intro to Processing, Coordinates, Primitive Shapes | |
| | Fri, Jan 10 | First Program, Debugging | |
| W2 | Mon, Jan 13 | Primitive Shapes, text | |
| | Wed, Jan 15 | Color | |
| | Fri, Jan 17 | Active Sketches, User Interaction | |
| W3 | Mon, Jan 20 | Active Sketches, User interaction, cont'd | **A1: Processing Basics** due on Thu, Jan 30 |
| | Wed, Jan 22 | Coordinate Transformation | |
| | Fri, Jan 24 | Variables and Math (A) | |
| W4 | Mon, Jan 27 | Variables and Math (B) | **A2: Coordinates Trans., Interactive Programs** due on Thu, Feb 6 |
| | Wed, Jan 29 | Variables and Math (C) | |
| | Fri, Jan 31 | Practice | |
| W5 | Mon, Feb 3 | Useful functions: map, norm, constrain | **A3: Variables and Anim.** due on Thu, Feb 13 |
| | Wed, Feb 5 | Useful functions: random, noise | |
| | Fri, Feb 7 | Images | |
| W6 | Mon, Feb 10 | Midterm Revision | **Revision** |
| | Wed, Feb 12 | **Midterm#1: written, in class** | |
| | Fri, Feb 14 | Review Midterm #1 Solutions | |
| W7 | Mon, Feb 17 | No class: Family Day / Midterm Break | No Lab |
| | Wed, Feb 19 | | |
| | Fri, Feb 21 | | |
| W8 | Mon, Feb 24 | Conditionals | **A4: Images** due on Thu, Feb 27 |
| | Wed, Feb 26 | Conditionals, cont'd | |
| | Fri, Feb 28 | Conditionals, cont'd | |
| W9 | Mon, Mar 2 | Loops | **A5: Conditionals** due on Thu, Mar 5 |
| | Wed, Mar 4 | Loops, cont'd | |
| | Fri, Mar 6 | Functions | |
| W10 | Mon, Mar 9 | Functions, cont'd | **A6: Loops, Functions** due on Thu, Mar 12 |
| | Wed, Mar 11 | Practice | |
| | Fri, Mar 13 | OOP | |
| W11 | Mon, Mar 16 | Midterms Revision | **Revision** |
| | Wed, Mar 18 | **Midterm#2: written, in class.** | |
| | Fri, Mar 20 | Review Midterms #2 Solutions | |
| W12 | Mon, Mar 23 | OOP, cont'd | **A7: More on Functions** due on Thu, Mar 26 |
| | Wed, Mar 25 | OOP, cont'd | |
| | Fri, Mar 27 | OOP, cont'd | |
| W13 | Mon, Mar 30 | Arrays | **A8: OOP** due on **Wed, Apr 1** |
| | Wed, Apr 1 | Arrays of Objects | |
| | Fri, Apr 3 | Built-in Array Functions From Processing to Java | |
| W14 | Mon, Apr 6 | *Tentative topics*: Processing Libraries, Gaming Techniques, Custom Shapes, Mathematics, Data Visualization, Intro to 3D | **Revision** |
| | Wed, Apr 8 | Final Exam Revision | |
| | Fri, Apr 10 | Good Friday. No classes | |