UBC OKANAGAN

COSC 121
Computer Programming II

Course Introduction

Dr. Mostafa Mohamed

Acknowledgement: The slides mainly rely on the textbook of Y. D. Liang titled “Introduction to Java Programming, 10th Ed.”, Pearson Edu. Inc.

The Instructor

Dr. Mostafa Mohamed

PhD (University of Calgary, Canada, 2012)

- Major Software Engineering
- Specialization AI / Image Processing

Communication

- E-mail: **mostafa.mohamed@ubc.ca**
- Office hours
  - **Friday 2:50PM-3:50PM In-person, SCI-200E**
  - **Or after lectures**

The Essence of the Course

To learn advanced programming techniques using the Object Oriented paradigm.

The skills you will acquire are in high demand for software development jobs. Programming skills make you more marketable and allow you to construct more sophisticated systems.

- This is a course on how to program with Java. It is a very applied course with specific skills.

Course is accessible on :

- **Canvas**

COSC 121

Description

- **Advanced programming** in the application of software engineering techniques to the design and implementation of programs manipulating **complex data structures**.

Prerequisite

- A score of 60% or higher in one of COSC 111, COSC 123.
  - You need to revise the concepts taught in COSC 111 / COSC 123 before you start working on COSC 121

Course Assessment

- Lecture quizzes 7 % (***in-class quizzes on iClicker, two lowest weekly marks will be waived***)
- Lab work: (total: 28%)
  - Lab Exercises 8 %
  - Assignments 20 %
- Exams (total: 65%)
  - Midterm 1 15% (**in-person during scheduled lecture time**)
  - Midterm 2 20% (**in-person, cumulative, during scheduled lecture time**)
  - Final 30 % (150 minutes, cumulative, **in-person**)

You must receive a combined grade of at least **50% on the exams** (final exam alone, and the combined exam including smidterms and final) to pass the course. Otherwise, you will be assigned a maximum mark of 45.

Lab Work

Lab work is critical to learning the material and is designed to prepare you for the exams!

- Exercises: effort based.
  - ***Aim***: motivate you to learn (you get solutions after you try), not for evaluation (**you receive marks for effort and dedication**)
- Assignments (A1, A2, …): graded
  - ***Aim***: evaluation + learn based on feedback
  - Designed similar to many exam questions (programming).
  - Usually, you have ***one or two weeks*** after **YOUR lab session** to complete them. The format is: "**due in *Wn***",
    - For example, **A1 is "due in w4"**, which means that A1 is due in the fourth week, which is one week after YOUR lab section at 11:59pm.

Assignments should be done ***INDIVIDUALLY***.

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 policy is applied:

***Policy*:**

- **0 to 24 hours late: 10% mark deduction**
  - e.g., if an assignment is worth 20 marks, then 5 marks will be deducted fr om the assignment mark; no negative marks will be given.
- **24 to 48 hours late: 20% mark deduction**
- **More than 48 hours: no mark.**

Missed Exams / Clickers

Without acceptable excuse

- …according the UBC Okanagan's policy on excused absences from examinations
- grade is 0.

With acceptable excuse:

- Midterms:
  - Weight shifted to the final exam.
- Final:
  - Must contact the Dean’s office to arrange for an out-of-time exam.

Missed clickers:

- no answers will be accepted except those provided during the lecture time using your own clicker account.

Course Format

Lecture (see the schedule in the syllabus)

- In-person lecture
  - May include **clicker** questions, we use Canvas

Labs

- Done individually (please attend your registered lab section)
- Must submit your work through the lab section in Canvas (be aware of your lab section's due date

Exams

- See schedule in syllabus for dates
- Final exam date is YTD (set by university)

See the syllabus for more details

Supplement Learning (SL)

"SL is a free, non-remedial, co-curricular service that supports UBC Okanagan's most challenging courses.

Available to all students enrolled in selected courses, weekly peer-facilitated study sessions are offered to help you:

- *Gain a more in depth understanding of your course content*
- *Meet students from your class in a small group format*
- *Maximize your study time through fun and collaborative activities*
- *Build and test your knowledge before you write an exam"*

https://students.ok.ubc.ca/academic-success/learning-hub/supplemental-learning/

SL sessions will be announced on Canvas.

Textbook and Reference Materials

Course website and discussion forum on Canvas

- **Lecture Notes (available on Canvas).**

Course is based on this textbook:

- **Y. D. Liang, Intro to Java Programming and Data Structures, 11th Edition, ISBN: 0134670949, 2017**
  - Earlier editions are also ok.
  - Both physical and electronic copies are available (check the syllabus)
- **Supplement material that come with the textbook:**
  - Review questions, solutions to even-numbered programming exercises, etc: **http://wps.pearsoned.com/ecs_liang_ijp_10**

Other good textbooks:

- P. Deitel and H. Deitel , Java How To Program (late objects) (10th Edition), ISBN: 0132575655, 2014
- (online) David J. Eck, Introduction to Programming Using Java, Sixth Edition, available at: http://math.hws.edu/eck/cs124/javanotes6/

Resources: Systems and Tools

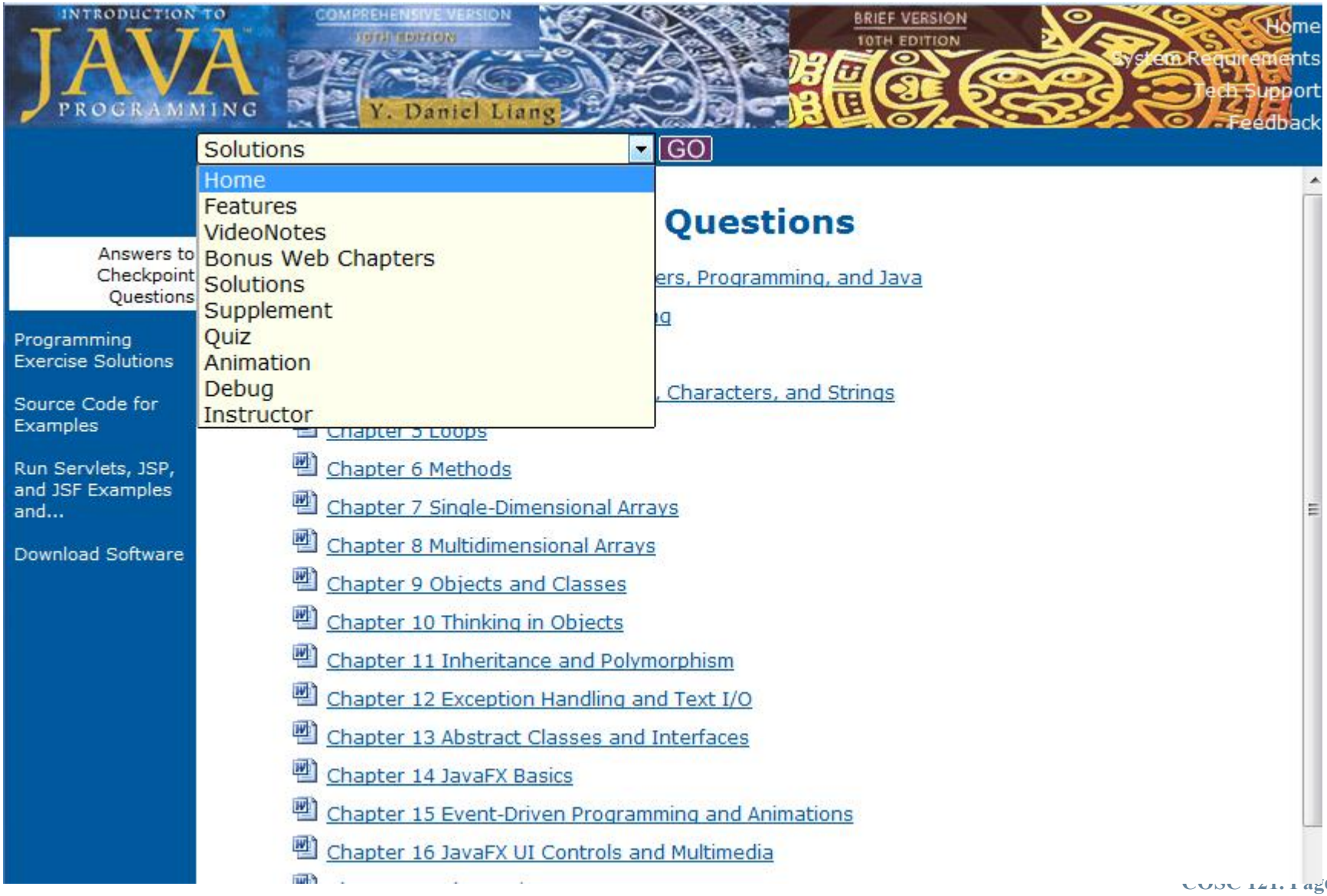
Canvas is used for posting marks, and for anonymous feedback.

You will need to download and install software for coding in Java.

Labs are equipped with all software required for the course

- not applicable to online teaching during the pandemic

Textbook Companion Website



Textbook Companion Website

Quiz GO

Self Test Multiple Choice Questions

2.1 _____ is the code with natural language mixed with Java code.

- A. Java program
- B. A Java statement
- C. Pseudocode
- D. A flowchart diagram

Check Answer for Question 1

2.2 What is the exact output of the following code?

```
double area = 3.5;
System.out.print("area");
System.out.print(area);
```

- A. 3.53.5
- B. 3.5 3.5
- C. area3.5
- D. area 3.5

Check Answer for Question 2

Section 2.3 Reading Input from the Console

2.3 Suppose a Scanner object is created as follows:

```
Scanner input = new Scanner(System.in);
```

What method do you use to read an int value?

How to Pass This Course

It is my best day when all my students pass the course, receive good grades, and feel the course was beneficial.

For that to happen, help me by putting enough effort for the course. The most important things to do to pass this course:

- Attend class
  - Revise previous class materials.
  - Read notes ***before*** class as preparation.
- Practice on class materials as soon as possible.
- Attend the labs and do all assignments
  - Labs are for marks and are practice to learn the material for the exams.
- Work hard on the project

To get an "A" in this course do all the above plus:

- Practice, practice, practice!

Academic Integrity

Cheating in all its forms is strictly prohibited and will be taken very seriously by the instructor. **NO GROUP WORK is allowed**!

Examples of what constitutes cheating:

- Assignments
  - Working in groups to solve questions and/or comparing answers to questions once they have been solved (except for group assignments).
  - Discussing HOW to solve a particular question instead of WHAT the question involves.
- Exams
  - All exams are closed book, so no course materials should be present.

Academic dishonesty may result in

- an "F" for the assignment or course
- ***all*** instances are recorded in the Dean's office.
- more serious consequences.
- More info here:
  - http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0
  - https://science.ok.ubc.ca/student-resources/academic-integrity

Search Results

https://jplag.ipd.kit.edu/example/index.html

Search

Submissions:	58 **(1 has not been parsed successfully)**
Invalid submissions (see log file) :	861221
Matches displayed:	25 (Treshold: 20.1%) (average similarity) 25 (Treshold: 22.0%) (maximum similarity)
Date:	2013-04-24
Minimum Match Length (sensitivity):	9
Suffixes:	.java, .jav, .JAVA, .JAV

Distribution:

90% - 100%	1	#
80% - 90%	0	.
70% - 80%	1	#
60% - 70%	0	.
50% - 60%	1	#
40% - 50%	1	#
30% - 40%	4	#
20% - 30%	18	#
10% - 20%	411	##########################
0% - 10%	1216	##

Matches sorted by average similarity (What is this?):

826764	->	826366 (100.0%)	
943151	->	942261 (70.4%)	862531 (21.1%)
878135	->	862531 (57.7%)	
861301	->	861196 (40.1%)	862246 (35.9%) 827825 (20.4%)

The Course Syllabus

It is important that all student carefully read the course syllabus.

Which Java concepts you need to remember from COSC111 / COSC 123?

Prerequisites

- Variables, constants, and data types.
  - Casting
  - Variables scope
  - Primitive vs. reference types
- Displaying output using
  - `println(), print(), printf()`
- Reading input
  - using `Scanner` methods
- Operators
  - Assignment (=)
  - Mathematical (unary, e.g., ++, and binary, e.g., +)
  - Logical (!, &&, ||, ^)
  - Relational (e.g., >)

Prerequisites

- Methods provided by Java
  - Math class (e.g., `sqrt()`, `pow()`, `sin()`, `random()`, etc)
  - Character class (e.g., `isDigit()`, `isUpperCase()`, etc)
  - String class (e.g., `length()`, `charAt()`, `indexOf()`, etc)

- Conditional Expressions
  - e.g., (x > 5 && y < 3)
    - Is it true or false?

- Selection
  - `if`, `switch`, `?`
    - Must know how to rewrite an statement using another Java keyword.
  - `break`

Prerequisites

- Loops
  - `for`, `for-each`, `while`, `do-while`
    - Must know when a loop will terminate and when it will be infinite.
  - '`break`' and '`continue`'
  - **Nested loops**
- User defined methods
  - Method calls
  - local variables (again)
  - Overloading and overriding
  - Stepwise refinement
- Arrays (1D and 2D)
  - Using loops with arrays
  - Passing/returning arrays to/from methods
  - Predefined class: Arrays

Prerequisites

- Introduction to OOP (we will revise this part)
  - How to create classes and objects
    - Attributes / constructors / methods
  - Instance vs. static class members
  - Visibility modifiers

- ~~Inheritance (we will revise this part)~~
  - ~~Methods overriding~~
  - ~~this vs. super~~

Question

Why are you here? Reasons why you are taking this course

A. I want an easy credit.

B. I want a Science credit.

C. I want to learn Programming.

D. COSC111/123 was very good course. Want to learn more.

E. Not sure! Someone told me it is a good idea to join this class.

Question

Which prerequisite course have you finished to get into COSC 121?

A. COSC 111 with me (Dr. Mostafa Mohamed)

B. COSC 111 with someone else

C. COSC 123

D. Both C and (A or B)

E. APSC 177

Question

How did you do in COSC111/123/177?

A. Barely got through

B. Not bad

C. Very good

D. Excellent

Question

What grade do you expect in COSC 121?

A. A

B. B

C. C

D. D

E. E

F. F

Question

How much do you remember about OOP?

A. Nothing… it is like my memory was wiped off right after the exam.

B. A little bit…

C. Most of it

D. Are you kidding… everything of course!

E. What is OOP!??