

## 3 and 5 Credit Courses Based on Udacity MOOC

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*Note: These recommendations are by Gerry Donaldson alone and not known to Alberta Education prior to their presentation to the Calgary Computer Science Teachers Symposium 20 June 2014.*

<b><i>Computer Science Education 101 (3 credits)</i></b>				
#	<i>Lesson</i>	<i>Assignment</i>	<i>Big Java 5<sup>th</sup> Edition Sections</i>	<i>CSE 1010, CSE 1110, CSE 1120</i>
1	Introduction	BlueJ Installation	1.1 - 1.7 Introduction	1010 (Nil) Computer Science 1
2	Objects	Draft Problem Set 1 Final Problem Set 1	2.1 - 2.8 Using Objects 2.9 - 2.10 Graphics (Ellipses, Lines, Text, Color)	1110 (Nil) Structured Programming 1 2110 (1120) Procedural Programming 1 [ 2140 Second Lang Programming 1 ]
3	Classes	Draft Problem Set 2 Final Problem Set 2	3.1 - 3.7 Implementing Classes 3.8 Graphics (Shape Classes)	1110 (Nil) Structured Programming 1 2110 (1120) Procedural Programming 1
4	Fundamental Data Types	No MOOC Assignment	4.1 – 4.5 Fundamental Data Types	2120 Data Structures 1 (first part)
5.1	Decisions	Draft Problem Set 3 Final Problem Set 3	5.1 – 5.8 Decisions	1120 (1110) – Structured Programming 2
5.2	Decisions	No MOOC Assignment		1120 (1110) – Structured Programming 2

<b><i>Computer Science Education 201 (3 credits)</i></b>				
#	<i>Lesson</i>	<i>Assignment</i>	<i>Big Java 5<sup>th</sup> Edition Sections</i>	<i>CSE 2110, CSE 2120, CSE 2910</i>
6.1	Loops	Draft Problem Set 4 Final Problem Set 4	6.1 – 6.9 Loops 6.10 Using a Debugger	1120 (1110) – Structured Programming 2
6.2	Loops	Draft Problem Set 5 Final Problem Set 5	6.1 – 6.9 Loops 6.10 Using a Debugger	1120 (1110) – Structured Programming 2
7.1	Arrays and ArrayLists	Draft Problem Set 6 Final Problem Set 6	7.1 Arrays 7.2 Enhanced FOR Loop	2110 (1120) – Procedural Programming 1
7.2	Arrays and ArrayLists	Draft Problem Set 7 Final Problem Set 7	7.3 – 7.5 Algorithms 7.6 Two-Dimensional Arrays	2120 (2110) – Data Structures 1 – arrays (1D & 2D) and records. Records are implemented as objects in Java. [ 3140 Second Language Programming 2 ]
7.3	Arrays and ArrayLists	No MOOC Assignment	7.7 ArrayLists 7.8 Regression Testing	
Not In MOOC	Project	Dossier Program		2910 CSE Project B

<b>Computer Science Education 301 (3 credits)</b>				
#	Lesson	Assignment	Big Java 5 <sup>th</sup> Edition Sections	CSE 2910, CSE 3120, CSE 3130
8	More About Classes	Draft Problem Set 8 Final Problem Set 8	8.1 – 8.5 Designing Classes 8.6 Unit Test Frameworks	3120 (2110) – OOP 1 (accessors, modifiers)
9	Interfaces and Inheritance	Draft Problem Set 9 Final Problem Set 9	9.1 – 9.3 Inheritance 9.4 Polymorphism	3120 (2110) – OOP 1 (Encapsulation, Modularity, Polymorphism)
9	Interfaces and Inheritance	No MOOC Assignment	10.1 – 10.6 Interfaces 10.7-10.10 GUI (not in MOOC)	3130 (3120) – OOP 2 (Inheritance)
Not In MOOC	Project	Program Dossier	12.1 – 12.2 OOP Design	3910 CSE Project D
<ul style="list-style-type: none"> <li>• Program Dossier Modelled After Dossier for International Baccalaureate Organization</li> <li>• Analysis --&gt; Problem Definition, Testing, Review Antecedents, Prototype</li> <li>• Detailed Design --&gt; Data Structures, Algorithms, Modular Organization</li> <li>• The Program --&gt; Style &amp; Internal Documentation, Usability, Handling Errors, Evaluating Success</li> <li>• Regression Testing --&gt; Test Driven: JUnit Testing</li> <li>• Documentation --&gt; Hard copy of test output: Data Validity, User Documentation, Javadocs Publication --&gt; Web Page: all files, executable JAR file, data files, Javadocs, Screen Recording</li> </ul>				

<b>Computer Science Education 30 (5 credits)</b>				
#	Lesson	Assignment	Big Java 5 <sup>th</sup> Edition Sections	CSE 3110, 3120, 3130, 3310, 3910
8	More About Classes	Draft Problem Set 8 Final Problem Set 8	8.1 – 8.5 Designing Classes 8.6 Unit Test Frameworks	3120 (2110) – OOP 1 (accessors, modifiers)
9	Interfaces and Inheritance	Draft Problem Set 9 Final Problem Set 9	9.1 – 9.3 Inheritance 9.4 Polymorphism	3120 (2110) – OOP 1 (Encapsulation, Modularity, Polymorphism)
9	Interfaces and Inheritance	No MOOC Assignment	10.1 – 10.6 Interfaces 10.7-10.10 GUI (not in MOOC)	3130 (3120) – OOP 2 (Inheritance)
Not In MOOC	Recursion	No MOOC Assignment	13.1 – 13.6 Recursion [ Kjell Tutorials 70-74 ]	3310 (3110, 3120) Recursive Algorithms 1
Not In MOOC	Sorting & Searching	No MOOC Assignment	14.1 – 14.8 Sorting & Searching	2010 (1010, 1120) – Com Science 2 – Sort, Search, Efficiency, Coupling, Merging 3110 (2120) – Iterative Algorithm 1 - Sequential & Binary Search. Bubble, Selection, Insertion, Merge Sorts.
Not In MOOC	Project	Program Dossier	12.1 – 12.2 OOP Design	3910 CSE Project D