**CMPT 151**

**Overview of Programming & Software Development Concepts**

Syntax:

1. Assignment
2. Arithmetic Operators: + - \* / %
3. Comparison Operators: >, <, ==, >=, <=, !=
4. Conditionals: if, if/else, if/else if/else
5. Loops: while, for, for each
6. Calling methods (like Java API: String, Math, Random)
7. Variables: fields, parameters, local variables
8. Collections: ArrayLists, arrays, HashSets, HashMaps

Imperative programming:

1. Storing single values (variables)
2. Storing lists of values (arrays or similar collection)
3. Methods (writing new & using existing)
4. Conditionals
5. Loops
6. Using basic arithmetic & logic, including comparison operators
7. Input & output (console/terminal and/or file I/O)

OO-Programming: Organizing the above constructs into…

1. Classes
2. Constructors
3. Methods
4. Fields
5. Inheritance
6. Aggregation/Composition
7. Polymorphism (methods & variables)

GUIs & Event-driven Programming:

1. Event handlers: wait for some event to happen
2. Listeners: listen for a particular event
3. Challenge: same event-handling code may be executed under many different conditions

Software Development:

1. Requirements: What are you going to develop?
2. Design: How will organize your code? What algorithms will you use? How to reduce coupling and code duplication, localize change, and have high cohesion? Does it make sense to use abstract classes or interfaces?
3. Development: How will you implement the design into executable code?
4. Testing: Does the implementation meet the requirements?
5. Maintenance: Are there new features/bugs that need to be added/fixed?