1. **Course:** CPSC 233: Introduction to Computer Science for Computer Science Majors II  
   **Lecture Sections:**  
   L01, MWF 12:00-12:50, Leonard Manzara, ICT 703, 220-3518, manzara@cpsc.ucalgary.ca  
   Office Hours: MWF 10:00-11:00  
   L02, MWF 10:00-10:50, Dina Said, ICT 502, 220-3326, dasaid@ucalgary.ca  
   Office Hours: W 13:00-16:00  
   **Course Website:** D2L  
   **Computer Science Department Office, ICT 602, 220-6015, cpsc@cpsc.ucalgary.ca**

2. **Prerequisites:** CPSC 231  
   ([http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620](http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620))

3. **Grading:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:  
   Assignments: 40%  
   Midterm Exam: 25%  
   Final Exam: 35%  
   *(Wednesday March 9th, 2016 at 18:00 in KNB 126, KNB 132 & ST 135)*  
   This course will have a Registrar’s Scheduled Final Exam.  
   **Special Regulations affecting the Final Grade (e.g. requirement to pass the final examination or to pass the laboratory to pass the course):** Each of the above components will be given a percentage grade. The final grade will be calculated using the weights given above and then converted to a final letter grade using the attached table. **To achieve an overall grade of C- or better in the course, you must achieve a minimum grade of C- or better in the final exam and complete all assignments.**

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar. Section 3.6. It is the student’s responsibility to familiarize himself with these regulations. See also Section E.6 of the University calendar.

5. **Scheduled Out-of-Class Activities:** REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a clash with this out-of-class activity, please inform your instructor as soon as possible so that alternative assignments can be arranged.

6. **Course Materials:**  

   **Online Course Components:** None.

7. **Examination Policy:** Closed book. No aids or any kind are allowed. Students should also read the Calendar, Section G, on examinations.
8. **Approved Mandatory and Optional Course Supplemental Fees:** None.

9. **Writing across the Curriculum Statement:** In this course, the quality of the student’s writing in the weighted components of the course will be a factor in the evaluation of these components. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:** See Section E.5 of the University Calendar.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

   a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offense that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K, Student Misconduct to inform yourself of definitions, processes and penalties.

   b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points which can be found in each classroom and building.

   c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Computer Science. Dr. Ben Stephenson, by email bdstephe@ucalgary.ca or phone 403-220-6781.

   d) **Safewalk:** Campus Security will escort individuals day or night (http://www.ucalgary.ca/security/safewalk/). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

   e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also http://www.ucalgary.ca/secretariat/privacy

   f) **Student Union Information:** VP Academic (403) 220-3911 suvpaca@ucalgary.ca SU Faculty Rep (403) 220-3913 science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca. Student Ombuds Office: (403) 220-6420 ombuds@ucalgary.ca, http://ucalgary.ca/provost/students/ombuds

   g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend your cell phone should be turned off unless instructed otherwise. All communications with other individuals via laptop computers, cell phones or other devices connectable to the internet in not allowed during class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

   h) **U.S.R.I.:** At the University of Calgary feedback provided by students through the Universal Student ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI surveys.

   Department Approval__________________________________________Date__________________________

   Associate Dean’s Approval for
   out of regular class-time activity: _______________________________ Date: __________________________

   *A signed copy of this document is kept on file in the Computer Science Main Office ICT 602*
<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>95-100</td>
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<tr>
<td>A</td>
<td>90-95</td>
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<tr>
<td>A-</td>
<td>85-90</td>
</tr>
<tr>
<td>B+</td>
<td>80-85</td>
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<tr>
<td>B</td>
<td>75-80</td>
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<tr>
<td>B-</td>
<td>70-75</td>
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<tr>
<td>C+</td>
<td>65-70</td>
</tr>
<tr>
<td>C</td>
<td>60-65</td>
</tr>
<tr>
<td>C-</td>
<td>55-60</td>
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<tr>
<td>D+</td>
<td>50-55</td>
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<tr>
<td>D</td>
<td>45-50</td>
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<tr>
<td>F</td>
<td>0-45</td>
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</tbody>
</table>
Introduction to Computer Science II
Detailed Syllabus

Introduction
Language Paradigms
Java History
Java Features
The Java Software Development Kit (SDK)
A Simple Application
A Simple Applet

Java Language Fundamentals
Reserved Keywords
Comments
Primitive Data Types
Integers
Floating Point
Boolean
Character
Wrapper Classes
Identifiers
Identifier Names
Variables
Constants
Strings
Object References
Default Initializations
Statements
Assignment Statements
Expressions
Operators
Arithmetic
Compound Assignment
Increment and Decrement
Relational
Logical
Bitwise
Operator Precedence and Associativity
String Operations
Data Conversions
Basic Input and Output

Control Structures
Sequential Structure
Blocks
Local Variables
Selection Structures
The if and if-else Statements
Ternary Operator
The switch Statement
Iteration Structures
The for Loop
The while Loop
The do-while Loop
The continue and break Statements
Infinite Loops

Object-Oriented Concepts
What is an Object?
State
Behavior
Identity
What is a Class?
Class Interface
Class Implementation
Encapsulation
Representing a Class in UML
  Class Symbol
  Attributes
  Operations
  Visibility

Java Class Fundamentals
  The Class Declaration
  Fields and Methods
    Instance Variables
    Class Variables
    Instance Methods
    Class Methods
    Method Parameters
    The return Statement
    Local Variables in Methods
  Access Control
  The main() Method
  Creating Objects
  Constructors
  The this Keyword
  Method Overloading
  Garbage Collection
  The finalize() Method

Arrays
  Introduction
  One-Dimensional Arrays
    Declaring Array Variables
    Creating Array Objects
    Indexing Array Elements
    Array Length
    Array Bounds Checking
    Initialization Lists
    Passing Arrays and Array Elements to Methods
    Array Assignment
  Two-Dimensional Arrays
    Declaring and Creating Two-Dimensional Arrays
    Initialization Lists
    Indexing Array Elements
  Arrays of Objects
  Arrays of Strings
  Enhanced for Loop
  Enumerated Types

Relationships Among Classes
  Inheritance
    Single and Multiple Inheritance
    Concrete Classes
    Abstract Classes
    Polymorphism
  Aggregation and Composition
  Association
  Class Diagrams in UML
    Class Relationships
    Multiplicity

Inheritance in Java
The extends Keyword
Implicit Subclassing
The super Keyword
Inheriting Structure
Inheriting Behavior
Access when Extending
Constructors in Extended Classes
The final Keyword
Aggregation/Composition in Java
Association in Java
Type Compatibility and Conversion
Runtime Polymorphism

Enhanced Class Design
Abstract Classes and Methods
Abstract Classes and Methods in UML
Interfaces
Creating Interfaces
Implementing Interfaces
Interface Inheritance
Interfaces in UML
Packages
The package Keyword
Creating Packages
Package Scope
Using Packages
Generics
Generic Classes
Generic Methods

GUI Basics and Event Handling
Introduction
Java GUI Elements
Event-Driven Programming
JDK Event Model
Events and Interfaces
Using Inner Classes for Handlers
Listener Adapter Classes

Components and Layout Managers
Swing Components
Adding Components to Containers
Key Swing Components
Containers
Container Class Hierarchy
Key Swing Containers
Layout Managers
Combining Layouts
The Model-View-Controller Design Pattern

Exceptions
Concepts
Library Exception Classes
Custom Exception Classes
Throwing Exceptions
Handling Exceptions
Catch-All Handler
Rethrowing Exceptions
Passing Exceptions Through

Concurrent Programming and Multithreading
Introduction
The Thread Class
The Runnable Interface
Starting and Terminating Threads
Thread Scheduling
Coordinating Threads
Synchronized Methods
Daemon Threads
Thread Groups
State Diagrams in UML

File Input and Output
Streams and Files
Writing Text Files
Reading Text Files
Parsing Text Streams
Writing Binary Files
Reading Binary Files
## CPSC 233
### Schedule
*(Subject to Change)*

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topics</th>
<th>Assignment Due</th>
<th>Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction, Java Language Fundamentals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Control Structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Object-Oriented Concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Java Class Fundamentals</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Arrays, Relationships Among Classes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Inheritance in Java</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Enhanced Class Design</td>
<td></td>
<td></td>
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</tbody>
</table>

### March 9
*Midterm*

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topics</th>
<th>Assignment Due</th>
<th>Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>GUI Basics and Event Handling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Components and Layout Managers</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>Exceptions</td>
<td></td>
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</tr>
<tr>
<td>11</td>
<td>Concurrent Programming and Multithreading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>File Input and Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Review</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### April 16 – 27
*Final*

### Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, Jan 11</td>
<td>Lectures start</td>
</tr>
<tr>
<td>Monday, Jan 18</td>
<td>Tutorials start</td>
</tr>
<tr>
<td>Friday, Jan 29, 4 pm</td>
<td>Assignment 1 due</td>
</tr>
<tr>
<td>Friday, Feb 12, 4 pm</td>
<td>Assignment 2 due</td>
</tr>
<tr>
<td>Monday, Feb 15 – Friday, Feb 19</td>
<td>Reading Week: no classes</td>
</tr>
<tr>
<td>Friday, March 4, 4 pm</td>
<td>Assignment 3 due</td>
</tr>
<tr>
<td>Wednesday, March 9</td>
<td>Common Midterm</td>
</tr>
<tr>
<td>Friday, March 25</td>
<td>Holiday: no classes</td>
</tr>
<tr>
<td>Monday, March 28, 4 pm</td>
<td>Assignment 4 due</td>
</tr>
<tr>
<td>Wednesday, April 13, 4 pm</td>
<td>Assignment 5 due; Lectures end</td>
</tr>
<tr>
<td>Saturday, April 16 – Wednesday, April 27</td>
<td>Final exam scheduled by Registrar</td>
</tr>
</tbody>
</table>

**Note:** Assignments handed in after their due dates are given a grade of zero. Extensions are only granted for medical or other serious reasons, and must be supported with documentation. Extensions must be requested before the due date in person from the professor (not the TA).