Course: Computer Programming - I (CSC111)
Academic Year: 1440 (2019)
Semester: Fall

Course Description:

Introduction to computers and programs. Simple algorithms' design and problem solving, byte code and Java Virtual Machine. Java program's structure, constants, variables and built-in data types. The arithmetic, assignment, increment and decrement operators. Classes and object definition, declaration of objects (Instance variables), primitive types and reference types. Relational and logical operators, Boolean expressions, conditional statements, loop statements. Object oriented principles, encapsulation and information hiding, methods and the message passing principles, setters, and getters. Methods in depth, passing parameters, constructors, setters. Arrays, usefulness of arrays, declaration of arrays, access to array elements, operations on arrays.

Textbook

- Java: An Introduction to Problem Solving and Programming, 8th Edition, W. Savitch, Pearson International (Textbook)

- Java™ Programming: From Problem Analysis to Program Design, 5th Edition, D. S. Malik (Reference)

- Java How to Program, 7th Edition, Deitel and Deitel, Pearson International (Reference)

- Introduction to Java Programming, Comprehensive Version, 10th Edition, Y. Daniel Liang, Prentice Hall (Reference)

Learning Outcomes

- Analyze simple computing problems and design algorithms to solve them.

- Apply the fundamentals of programming such as variables, conditional and iterative execution, methods, arrays, etc. for implementing basic algorithms.

- Apply basic concepts of object-oriented programming, such as defining classes and objects, setters and getters, etc. for solving simple programming problems.

- Use an IDE for developing, debugging, testing and documenting programs.

- Work on a programming project that combines the different concepts and techniques learned in the course.

Plan

Units	Week #	Topic	Course Materials	Labs, Lab exams	Assignments
3	1	Introduction to computers and Java: computer basics, algorithms and Java programming basics	Chapter 1		
2	2	Variables, Data Types, Identifiers, Assignment	Ch 2.1	LAB-1 (Hello world, variables, assignment)	Assignment-1 OUT
1		Simple Input / Output	Ch 2.1		
2	3	Constants, Type Casting, Arithmetic Operators, Operator precedence	Ch 2.1	LAB-2 (variables, IO, expressions)	Assignment-1 DUE Assignment-2 OUT
1		Case study: vending machine change	Ch 2.1		
2	4	Increment and decrement, keyboard and screen I/O, documentation and Style	Ch 2.1, 2.3		Assignment-2 DUE Assignment-3 OUT
1		Basic if-else statement, Boolean expressions	Ch 3.1		
1	5	Nested if-else statement, multibranch if statement	Ch 3.1	LAB-3 (if statement, Boolean expressions)	Assignment-3 DUE Assignment-4 OUT
1		Case Study, exit Method (conditional operator not included)	Ch 3.1		
1		Comparing strings, The type Boolean	Ch 3.1, 3.2		
1	6	Switch statement, Enumerations	Ch 3.3	LAB-4 (simple loops)	Assignment-4 DUE Assignment-5

1		The while statement	Ch 4.1		OUT
1		do-while statement, programming example	Ch 4.1		
1	7	For statement (for-each not included)	Ch 4.1	LAB-5 (Nested loops)	Assignment-5 DUE Assignment-6 OUT
1		Nested loop	Ch 4.1		
1		Programming with loops, loop bugs, tracing variables (break and continue, assertion not included)	Ch 4.2		
1	8	Classes: Instance variable	Ch 5.1		Assignment-6 DUE Assignment-7 OUT
1		Programming Example	Ch 5.1		
1		Methods, void Method, Method that return a value	Ch 5.1		
1	9	The keyword this, Local variables, blocks	Ch 5.1	LAB-6 (Objects)	Assignment-7 DUE Assignment-8 OUT
1		Parameters of a primitive type	Ch 5.1		
1		Information hiding, public and private modifiers	Ch 5.2		
2	10	Accessor (getters) and mutator methods (setters), Encapsulation	Ch 5.2	LAB-7 (objects and methods)	Assignment-8 DUE Assignment-9 OUT
1		Methods calling methods			

			Ch 5.2		
1	11	Variable of class type (references)	Ch 5.3	LAB-8 (Information hiding, encapsulation)	Assignment-9 DUE Assignment-10 OUT
1		Defining and equals method for a class, Parameters of class type	Ch 5.3		
1		Constructors	Ch 6.1		
1	12	Static variables and methods	Ch 6.2	LAB-9 (Constructors, static variables & methods, overloading)	Assignment-10 DUE Assignment-11 OUT
1		Overloading	Ch 6.4		
1		Array basics	Ch 7.1		
1	13	Array basics programming example	Ch 7.1	LAB-10 (array processing)	Assignment-11 DUE Assignment-12 OUT
1		Arrays in classes and methods	Ch 7.2		
1		Array of objects	Ch 7.3		
3	14	Operations on Arrays (add, search, delete, sort)	(Instructor Notes)	LAB-11 (Arrays)	Assignment-12 DUE Project OUT
		Final Exam			

Assessment Methods & Policy

Homework, Quizzes, and Attendance	15%	10% Homework Assignments 5% Class Project

Lab	25%	10% Lab exam 1
		15% Lab exam 1
Written Midterm Exams	20%	10% Midterm exam 1
		10% Midterm exam 2
Written Final Exam	40%	

Homework assignments:
Homework will be assigned and graded. All homework assignments will be given with a strict deadline, and students are required to submit the assignments on or before the deadline. Cheating will not be tolerated.

Quizzes
In-class quizzes will be given throughout the semester to assess the described course outcomes.

Continuous Evaluation Exams
There will be two exams. Each one will be conducted during a lab session for 2 hours under the supervision of the lab instructor. Each exam will consist of a single programming problem. The student will be presented with a detailed problem statement and asked to write, compile and run a full Java program to solve the problem. The answer-program should be written using Eclipse (or any other IDE available for students in the lab). Unlike during regular lab sessions, the student should not expect any help from the lab instructor.

Written Midterm Exams
Two Midterms will be given. It will be a closed book and closed note exam and will cover the studied part of the course.

- **Mid Term 1**: It covers: from the beginning, up to the conditional statements (usually scheduled in the 6th week of the term)
- **Mid Term 2**: It covers all studied concepts but the array structure (usually scheduled in the 11th week of the term).

Written Final Exam
A comprehensive final examination will be given. It will be a closed book and closed note exam and will cover all course material.

Deadline Policy
All homework assignments will be given a strict deadline, and students are required to submit their assignments on or before the deadline. They will be collected at the start of the class on the due date, and late submissions will not be accepted. In the case of extenuating circumstances, students are advised to contact the professor as soon as possible. You are

encouraged to discuss the course and the assignments with each other, however, your exams and home works <u>must be your own work</u>.

Attendance Policy
Attendance will be taken. Attendance will be graded as cited above and may be used as a deciding factor upon calculating final average grades. The student will be denied final exams if he exceeds 25% absence rate (including the lectures, tutorials, and labs). Excuses of absence are accepted no later than one week of the absence.

Computer usage
All homework assignments or project documents should be submitted using MS-Word and/or appropriate computer software. No hand-written submission will be accepted.