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81, Oedae-ro, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17035, Korea

Hankuk University of Foreign Studies

2023 Winter Session

CSC 170 Introduction to Computer Science

Course Outline

Course Code: CSC 170

Instructor: Dr. Suman Saha

Home Institution: Pennsylvania State University

Office Hours: By appointment

Email: szs339@psu.edu

Credit: 4

Class Hours:

This course will have 52 class hours, including 32 lecture hours, professor 8 office hours, 8-hour TA discussion sessions, 4-hour review sessions.

Course Description:

The course introduces high-level introduction to the field of computer science as well as Introduction to programming like fundamentals of structured and object-oriented programming using Java. The intended audience of this course are non-CS or undeclared majors who are interested in learning how computers work and what the field of computer science encompasses. No prior experiences with computers are assumed.

Objectives of Course:

After the course, student will be able to write an algorithm of a simple task and convert the algorithm into java program. The course teaches an introduction of basic computer concepts such as: computers and programs, components of a computer, problem solving, and programming. Java concepts presented in this course include basic input and output, variables and assignments, branches, loops, arrays, methods, objects and classes, input/output streams, and exception handling. Students will learn to develop an understanding of object-oriented programming, and implement into Java programs basic concepts including inheritance, and polymorphism.

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Required Textbooks:

1. *Understanding the Digital World: What You Need to Know about Computers, the Internet, Privacy and Security.* Brian W. Kernighan. Princeton University Press, 2017, ISBN: 9781400884803
2. Java Illuminated third edition by Anderson.

Grading System (1 ~ 100)

The final score with be scaled and the scaled score with be used to assign a Course grade.

A+ : 96 - 100	A : 91 - 95
B+ : 86 - 90	B : 81 - 85
C+ : 76 - 80	C : 71 - 75
D+ : 66 - 70	D : 60 - 65
F : 0 - 59	
Pa : Pass	Fa : Fail

Course Schedule:

Week1

- *Hardware:*
  - Session 1: What's in a computer? Types of computers, devices and components of a computer, types of memory
  - Session 2: Understanding CPU, how computer work/inside the CPU
- *Software:*
  - Session 3: Algorithm, understanding algorithm complexity, identify efficient algorithm, and designing algorithm
  - Session 4: Programming Languages and Concepts of programming, types of programming language, machine language, low-level language, high-level language, compiler, and interpreter, how compiler does work

(Quiz 1 and HW1)

Details of HW: Students will be given a set of tasks. They with write several versions of algorithm for each task. They will compare different versions of the algorithm to find the most efficient algorithm.

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Week2

- *Writing Program*
    - Session 1: Install Java, setup Java environment, Java syntax, Expression, Statement, Variables, Data Types, casting, and operators
    - Session 2: Blocks, the basic If statement, If-else statement, if-else-if statement, the switch statement
    - Session 3: Loops: the basic while loop, do..while loop, break and continue, for loop, nested for loop
- *Exam*
    - Session 4: Midterm Exam

Week3

- *Object Oriented Programming*
    - Session 1: Introduction to Object Oriented Programming, abstraction. Encapsulation, inheritance, polymorphism
    - Session 2: Implementing Classes and Methods: static method and variables, object, classes, and instances, getter and setter method, constructor, built-in classes
    - Session 3: Implementing Inheritance: extending existing classes, Inheritance, and class hierarchy, this and super keyword
    - Session 4: Implementing Polymorphism: method overloading, method overriding

(Quiz 2 and HW2)

Details of HW2: The students will be given a set of programming problems. They will write Java programs to solve those problems using control structure, loops, object-oriented programming concepts.

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Week4

- *Advanced Topics*
    - Session 1: Arrays: creating and using arrays, arrays and for loop, arrays of objects, passing arrays to function call
    - Session 2: File Input/Output: Java file handling, creating a file, write a file, and read from a file.
    - Session 3: Exception Handling: Exceptions, try..catch block, finally and throw keyword
- *Exam*
    - Session 4: Final Exam