City University of Hong Kong
Course Syllabus

offered by College/School/Department of Electrical Engineering
with effect from Semester B in 2019/2020

Part I   Course Overview

Course Title: Java Programming and Applications

Course Code: EE3206

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: B3

Proposed Area:
(for GE courses only)

☐ Arts and Humanities
☐ Study of Societies, Social and Business Organisations
☐ Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title)
EE2331 Data Structures and Algorithms
or equivalent

Precursors:
(Course Code and Title) Nil

Equivalent Courses:
(Course Code and Title) EE2311 Object-oriented Programming and Design

Exclusive Courses:
(Course Code and Title) Nil

Part II Course Details

1. Abstract

The aim of this course is to provide students with an understanding of the object-oriented design and programming techniques. Java, a prime object-oriented programming language, is used to illustrate this programming paradigm.

2. Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Apply object-oriented programming paradigm and common design patterns to system designs.		✓	✓	
2.	Apply structural programming approach and data structures to solve more complex computation problems.		✓	✓	✓
3.	Explain how and why genericity is implemented in computer programs and recognize common design patterns.		✓		
4.	Apply system-level techniques such as multi-threading, database and Event-driven user interface in software development.		✓	✓	✓
	* If weighting is assigned to CILOs, they should add up to 100%.	100%			

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.
A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.
A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
Lecture and Tutorial	Teaching activities are primarily based on lectures followed by simple examples to show students the basic skills. Tutorials are conducted in the laboratory. Students will acquire the programming skills via hands on experiences in writing Java codes.	✓	✓	✓	✓			2 hrs Lect/wk 2 hrs Tut/wk
Assignments and mini project	Assignments are to be completed by students individually. Students may form a small group or individually carry out a mini-project that goes through different phases of software development. Students will have chances to review the design from peers and therefore reinforce their learning. Extra readings are provided for self-study and reference. The readings are generally related to lectured topics and allow students to pursue more details as well as bridge the conceptual gap between theories and applications.	✓	✓	✓	✓			N/A

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4				
Continuous Assessment: <u>50 %</u>								
Tests (min 2)	✓	✓	✓	✓			25%	
#Assignments (min.3)	✓	✓	✓	✓			25%	
Lab Exercises/Reports							N/A	
Examination: <u>50%</u> (duration: 2.5 hrs , if applicable)								
Examination	✓	✓	✓	✓			50%	
The weightings should add up to 100%.							100%	

Remark:
To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.
may include homework, tutorial exercise, project/mini-project, presentation

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Examination	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels

6.   Constructive Alignment with Major Outcomes

MILO	How the course contribute to the specific MILO(s)
1,3,5,10	This course provides essential knowledge and techniques for designing and implementing software systems. Students have ample opportunities to practice these skills with modern software development tools. A system design project will be carried out by students. They are required to identify their goals, analyze some practical problems as well as develop their own solutions.

Part III Other Information (more details can be provided separately in the teaching plan)

1.   Keyword Syllabus:

Object-oriented principles and design

Objects and classes; information hiding; encapsulation; data abstraction; inheritance and polymorphism; discovering class relationships; unified modeling language (UML) and diagrams; design patterns; software development process

Overiew of the Java language

Java technologies and platform; basic Java syntax; classes and methods; String and wrapper classes; class definition and packages; method overloading and overriding; superclasses and subclasses; dynamic binding and generic programming; abstract classes and interfaces; binary and text I/O; exceptions and assertions.

GUI programming

Graphical user interface components; frame and layout management; event-driven programming; applets.

Software design using Java

Java Collection Framework (JCF); applications of standard data structures, e.g. scheduling and optimization problems. Multi-threading; thread safety and liveness; thread corporation and synchronization; task partitioning and performance optimization. Data processing applications; Java Database Connectivity (JDBC); accessing and updating relational database.

2.   Reading List
2.1 Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Lecture notes

2.2   Additional Readings
(Additional references for students to learn to expand their knowledge about the subject.)

1.	Y. Daniel Liang, Introduction to JAVA Programming Brief Version, 9/E, Prentice Hall	
2.	Java SE 8 API Specification	http://docs.oracle.com/javase/8/docs/api/
	Oracle Java Tutorials	http://docs.oracle.com/javase/tutorial/index.html