

EE3206: JAVA PROGRAMMING AND APPLICATIONS

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Java Programming and Applications

Subject Code

EE - Electrical Engineering

Course Number

3206

Academic Unit

Electrical Engineering (EE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

EE2331 Data Structures and Algorithms
or equivalent

Precursors

Nil

Equivalent Courses

EE2311 Object-oriented Programming and Design

Exclusive Courses

Nil

Part II Course Details

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.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply object-oriented programming paradigm and common design patterns to system designs.	x	x	
2	Apply structural programming approach and data structures to solve more complex computation problems.	x	x	x
3	Explain how and why genericity is implemented in computer programs and recognize common design patterns.	x		
4	Apply system-level techniques such as multi-threading, database and Event-driven user interface in software development.	x	x	x

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 real-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.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	<p>Lecture and Tutorial</p> <p>Teaching activities are primarily based on lectures followed by simple examples to show students the basic skills.</p> <p>Tutorials are conducted in the laboratory. Students will acquire the programming skills via hands on experiences in writing Java codes.</p>	1, 2, 3, 4	3 hrs Lect/wk 1 hrs Tut/wk

2	Assignments and mini project	<p>Assignments are to be completed by students individually.</p> <p>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.</p> <p>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.</p>	1, 2, 3, 4	N/A
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Tests (min 2)	1, 2, 3, 4	25	
2	#Assignments (min.3)	1, 2, 3, 4	25	
3	Lab Exercises/Reports			

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2.5

Additional Information for ATs

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

Assessment Rubrics (AR)**Assessment Task**

Examination

Criterion

Achievements in CILOs

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Coursework

Criterion

Achievements in CILOs

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

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.

Overview 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.

Reading List**Compulsory Readings**

Title	
1	Lecture notes

Additional Readings

Title	
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