LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG (OBJECT-ORIENTED PROGRAMMING)
Đề cương chi tiết (Course Syllabus)

1. General Information

Course name: Lập trình hướng đối tượng (Object-Oriented Programming)

Course code: INT1332_CLC

Number of credits: 3

2. Objectives

Knowledge:

The aim of this course is to provide learners the important knowledge of object oriented programming method, including:

- Fundamental knowledge about object-oriented methodology.
- Knowledge of Java programming language, object oriented programming in Java.
- Knowledge about Exception handling techniques, programming Graphical User Interface, Generics and Collections in Java.

Skills:

The aim of this course is to equip learners in solving a real problem with skills in:

- Ability to write multi-class programs with the Java programming language following object-oriented principles.
- Ability to coordinate and work in groups

Attitude:

Learners are required to attend the classes and complete assignments/projects.

3. Abstracts

This course provides fundamental knowledge of object-oriented programming and advanced programming skills with the Java programming language. Students will be equipped with object-oriented methodology such as concept formulation, class modeling and fundamentals of object modeling technique. This course also provides students with basic to advanced skills of Java programming language.

4. Teaching and learning methods

Lectures:	30h
Exercises:	08h
Projects :	0h
Lab :	06h
Individual reading:	01h

5. Prerequisites

6. Learning outcomes

After studying this course, the learner could:

[CLO1]: Understand the fundamental knowledge about object-oriented methodology

[CLO2]: Understand and implement programs with the Java programming language following object-oriented principles

[CLO3]: Understand and implement exception handling techniques with the Java programming language

[CLO4]: Understand and implement programs having GUI (Graphical User Interface)

[CLO5]: Understand and get familiar with generics programming and collections in Java

7. Assignment criteria

Learning outcomes	Assignment criteria
[CLO1]: Understand the fundamental knowledge about object-oriented methodology	Fundamental knowledge about object-oriented methodology
[CLO2]: Understand and implement programs with the Java programming language following object-oriented principles.	Object oriented programming in Java
[CLO3]: Understand and implement exception handling techniques with the Java programming language	Exception handling in Java
[CLO4]: Understand and implement programs having GUI (Graphical User Interface)	Graphical User Interface (GUI) in Java
[CLO5]: Understand and get familiar with generics programming and collections in Java	Generics and Collections in Java

8. Outlines

Chapter 1. Introduction to object oriented programming

1.1. What is object oriented programming?
1.2. Difference between object oriented programming and procedure oriented programming
1.3. Object oriented programming concepts
1.3.1. Classes, objects, and data encapsulation
1.3.2. Class relationships

5.2.3. AWT Components
5.2.4. Layout managers
5.2.5. Event handling
5.3. Swing
5.3.1. Introduction
5.3.2. Swing's features
5.3.3. Using swing API
5.3.4. Swing containers
5.3.5. Swing Components
5.4. Using visual GUI builder - NetBeans/Eclipse
5.5. Summarization of chapter 5

Chapter 6. Generics and Collections in Java
6.1. Generic types and methods
6.2. Bounded type Parameters
6.3. Generics, inheritance, and subtypes
6.4. Wildcards
6.4.1. Upper bounded wildcards
6.4.2. Unbounded wildcards
6.4.3. Lower bounded wildcards
6.4.4. Wildcards and subtyping
6.4.5. Wildcard capture and helper methods
6.5. Java collections framework overview
6.6. List, stack, queue
6.7. Set and map
6.8. Summarization of chapter 6

9. Required Textbooks

[1]. Y. Daniel Liang. Introduction to Java Programming. 10th edition, Prentice Hall, 2015.

10. Suggested Textbooks

[2]. H. Schildt. Java: The Complete Reference.11th edition, McGraw-Hill, 2018. Education.

[3]. The Java Tutorials, Oracle Java Documentation (https://docs.oracle.com/javase/tutorial/).

11. Schedule

Main contents	Duration	Specific contents
Chapter 1. Introduction to object oriented programming	4h lecture	1.1. What is object oriented programming? 1.2. Difference between object oriented programming and procedure oriented programming 1.3. Object oriented programming concepts

		1.4. Development trends of object oriented programming 1.5. Object oriented programming languages 1.6. Summarization of chapter 1
Chapter2. Introduction to Java programming language	6h lecture 2h excise 2h lab	2.1. History of Java language 2.2. Java platforms 2.3. Java features 2.4. Java architecture 2.5. Setting up the environment for Java 2.6. Java program template 2.7. Debug and execute a Java program 2.8. Data, variables and data types 2.9. Java operators 2.10. Input, output in Java 2.11. Java control statements 2.12. Summarization of chapter 2
Chapter 3. Object oriented programming in Java	8h lecture 2h excise 2h lab	3.1. Classes, objects, and data encapsulation 3.2. Class relationships in Java 3.3. Polymorphism in Java 3.4. Interfaces in Java 3.5. Abstraction in Java 3.6. Summarization of chapter 3
Chapter 4. Exception handling in Java	6h lecture 2h excise 2h lab	4.1. Introduction to exception handling 4.2. Method call stack 4.3. Exception & call stack 4.4. Exception classes - Throwable, Error, Exception & RuntimeException 4.5. Checked vs. unchecked Exceptions 4.6. Exception handling operations 4.7. try-catch-finally 4.8. Common exception classes 4.9. Creating your own exception classes 4.10. Summarization of chapter 4
Chapter 5. Programming Graphical User Interface (GUI) in Java	6h lecture 2h excise	5.1. Introduction 5.2. Programming GUI with AWT 5.3. Swing 5.4. Using visual GUI builder - NetBeans/Eclipse 5.5. Summarization of chapter 5

12. Grading Policy

Attendance: 10%
Exercises: 20%

Mid-term projects/exams:	20%
Final examination (lab):	50%