# OBJECT ORIENTED PROGRAMMING

## 1.Thông tin về học phần (General Information)

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|---|---|
| **Tên học phần (Course name)**: | Object Oriented Programming |
| **Mã học phần (Course code)**: | INT1332 |
| **Số tín chỉ (Number of credits)**: | 3 |
| **Loại học phần (Course type)**: | Compulsory |

**Học phần tiên quyết (Prerequisites)**:

Introduction to computing and programming

**Học phần trước (Previous courses)**:

**Học phần song hành (Parallel courses)**:

**Các yêu cầu đối với học phần (Course requirements)**:

- Lecture room: Projector, microphone, speaker, and air conditioner.
- Laboratory: Computers with NetBeans or Eclipse, JDK

**Giờ tín chỉ đối với các hoạt động (Teaching and Learning hours)**:

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| - Lectures (lí thuyết): | 30h |
| - Exercises (bài tập): | 0h |
| - Projects (bài tập lớn): | 08h |
| - Lab (thực hành): | 07h |
| - Individual reading (tự đọc): | 0h |

**Địa chỉ Khoa/Bộ môn phụ trách học phần (Address of the Faculty/Department in charge of the course):**

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|---|---|
| - Address: | Faculty of Information Technology 1 - Posts and Telecommunications Institute of Technology, Km10, Nguyen Trai Street, Ha Dong District, Hanoi. |
| - Phone number: | (024) 33510432 |

## 2. Mục tiêu học phần (Objectives)

**Về kiến thức (Knowledge):**

On completion of this course, students will be able to develop a program with object-oriented specifications such as classes, objects, interface and so on. The advanced knowledge is about programming with graphical user interface and I/O. Students are also able to solve a real problem with the Java programming language.

**Kỹ năng (Skills):**

On successful completion of this course, students will:

- understand of the basic characteristics of object-oriented methodology;
- have basic object-oriented programming skills with Java language;
- be able to apply object-oriented programming method with Java to solve the practical problems.

**Thái độ, Chuyên cần (Attitude):**

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

## 3. Tóm tắt nội dung học phần (Description)

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 modelling and fundamentals of object modelling technique. This course also provides students with basic to advanced skills of Java programming language.

## 4. Nội dung chi tiết học phần (Outlines)

**Chapter 1 Introduction to Java programming**

1.1. Introduction to Java
1.2. Java programming steps
1.3. Compile and run
1.4. Java terminology and syntax
1.5. Java program template
1.6. Output via System.out.println() and System.out.print()
1.7. A simple program
1.8. Java program
1.9. Variables and operations
    1.9.1. Variables
    1.9.2. Data types
    1.9.3. Constants
    1.9.4. Type conversion
    1.9.5. Assignment
    1.9.6. Basic arithmetic operations
1.10. Questions and exercises

**Chapter 2 Java basics**

2.1. Basic syntaxes
    2.1.1. Steps in writing a Java program
    2.1.2. Java program template
    2.1.3. A sample program illustrating sequential, decision and loop constructs
    2.1.4. Comments
    2.1.5. Statements and blocks
    2.1.6. White spaces and formatting source code
2.2. Variables and types
    2.2.1. Variables - name, type and value
    2.2.2. Identifiers (or names)
    2.2.3. Variable declaration
    2.2.4. Constants (final variables)
    2.2.5. Expressions
    2.2.6. Assignment (=)
2.3. Primitive types and string
    2.3.1. Built-in primitive types
    2.3.2. Integers vs. floating-point numbers
    2.3.3. Data representation
    2.3.4. Maximum/minimum values of primitive number types
    2.3.5. One more important type - string
    2.3.6. Choice of data types for variables
    2.3.7. Literals for primitive types and string

7.2.4. AWT component classes
7.2.5. AWT examples
7.3. AWT event-handling
7.4. Nested (Inner) classes
7.5. Event listener's adapter classes
7.6. Layout managers and panel
7.6.1. FlowLayout
7.6.2. GridLayout
7.6.3. BorderLayout
7.6.4. Using Panels as sub-container to organize components
7.6.5. BoxLayout
7.7. Swing
7.7.1. Introduction
7.7.2. Swing's features
7.7.3. Using swing API
7.7.4. Swing program template
7.7.5. Swing examples
7.8. Using visual GUI builder - NetBeans/Eclipse
7.8.1. NetBeans
7.8.2. Eclipse
7.9. Questions and exercises

**Chapter 8 Generics and collections**
8.1. Generic types and methods
8.2. Bounded type Parameters
8.3. Generics, inheritance, and subtypes
8.4. Wildcards
8.5.1. Upper bounded wildcards
8.5.2. Unbounded wildcards
8.5.3. Lower bounded wildcards
8.5.4. Wildcards and subtyping
8.5.5. Wildcard capture and helper methods
8.5. Java collections framework overview
8.6. List, stack, queue
8.7. Sets and maps
8.8. Algorithms
8.9. Questions and exercises

## 5. Học liệu (Textbooks)

### 5.1. Học liệu bắt buộc (Required Textbooks)

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

### 5.2. Học liệu tham khảo (Optional 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/).

## 6. Phương pháp, hình thức kiểm tra – đánh giá kết quả học tập học phần (Grading Policy)

| Grading method | Percentage | Group/Individual |
|---|---|---|
| - Attendance | 10% | Individual |

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|---|---|---|
| - Exercises | 20% | Individual |
| - Mid-term projects/exams | 20% | Group or individual |
| - Final examination (lab) | 50% | Individual |

**Trưởng Bộ môn**
**(Head of Department)**

**Giảng viên biên soạn**
**(Lecturer)**

**Nguyễn Mạnh Hùng**

**Hoàng Hữu Hạnh**