INFORMATION SYSTEM ANALYSIS AND DESIGN

1.Thông tin về học phần (General Information)

Tên học phần (Course name): Information System analysis and Design

Mã học phần (Course code): INT1342

Số tín chỉ (Number of credits): 3

Loại học phần (Course type): Compulsory

Học phần tiên quyết (Prerequisites):

- Software Engineering (INT1340)

Học phần trước (Previous courses):

Học phần song hành (Parallel courses):

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

- Lecture room: Projector, microphone and speaker, air conditioner.
- Laboratory:

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

- Lectures (lí thuyết): 36h
- Exercises (bài tập): 0h
- Projects (bài tập lớn): 08h
- Lab (thực hành): 0h
- Individual reading (tự đọc): 01h

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

- 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):

The aim of this course is to provide learners with knowledge and skills for object oriented software analysis and design. They include classes and relationships, software models with UML, requirement determination, analysis and design in object oriented approach. Learners will apply these skills and knowledge and make use of tools for developing software projects.

Kỹ năng (Skills):

On successful completion of this course, a learner will be able to:

- use UML diagrams for modeling software systems
- make use of tools such as VP in representing UML diagrams
- apply knowledge and skills of analysis, design and implementation for developing of software projects technique into the development of a software.

Thái độ, Chuyên cần (Attitude):

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

3. Tóm tắt nội dung học phần (Description)

On completion of this course, learners are able to understand and apply knowledge and skills of object-oriented paradigm to develop large scale software systems. They include classes and relationships, software models with UML, requirement determination, analysis and design in object-oriented approach.

Learners are also able to take part in software projects as well as in develop software phases from requirement determination, analysis and design as well as implementation.

4. Nội dung chi tiết học phần (Outlines)

Chapter 1 Foundations for developing information systems

1.1. Types of information systems
1.2. Approaches for developing information systems
    1.2.1 Basic components of information system
    1.2.2 Principles of software development
    1.2.3 From structure programming to object-oriented software development
1.3. Basic concepts of object-oriented software systems
    1.3.1 Class and objects
    1.3.2 Methods and message
    1.3.3 Encapsulation
    1.3.3 Inheritance
    1.3.4 Relationship among classes
1.4. Reuse
1.5. Methodology for object-oriented software development
    1.5.1 Concept of methodology
    1.5.2 Phases of software development
    1.5.3 Object oriented methodology
    1.5.4 Unified process (UP) methodology and its variances

Chapter 2 Modeling object-oriented information systems

2.1. Introduction to UML
    2.1.1. Features of unified modeling language (UML)
    2.1.2. Views in UML
    2.1.3. Basic concepts in UML
2.2. Diagrams in UML
    2.2.1. Hierarchy of UML diagrams
    2.2.2. Use case
    2.2.3. Class and relationship
    2.2.4. Sequence diagram
    2.2.5. Communication diagram
    2.2.6. Activity diagram
    2.2.7. Package and deployment diagram
2.3. Tools and technologies for information development
2.4. Case study

Chapter 3 Requirement Determination

3.1. Steps in requirement determination
3.2. Business perspective
    3.2.1. Identifying business actors and use cases
    3.2.2. Writing glossary
    3.2.3. Illustrating use cases on activity and sequence diagrams
3.3. Developer perspective
    3.3.4. Specializing actors
    3.3.5. Use case relationships
    3.3.6. Scenarios
    3.3.7. Prioritizing use cases

3.3.8. User interface sketches
3.4. Case study
Chapter 4 Requirement analysis
4.1. Analysis process
4.2. Static analysis
4.2.1. Finding classes
4.2.2. Identifying class relationships
4.2.3. Drawing class diagrams
4.2.4. Attributes
4.3. Dynamic analysis
4.3.1. Identifying boundary, controller and entity classes
4.3.2. Drawing sequence diagrams
4.3.3. Adding operations/methods to classes
4.3.4. Identifying methods based on responsibility
4.3.5. State diagram
4.4. Case study
Chapter 5 Designing System Architecture
5.1. Steps in system design
5.2. Network technology/topology selection
5.2.1. Distributed architecture types
5.2.2. Technologies of tiers for system development
5.3. Partitioning software system
5.4. Package and deployment diagrams for system architecture
5.5. Case study
Chapter 6 Designing Subsystems
6.1. Steps in subsystem design
6.2. Mapping the analysis class model into the design class model
6.2.1. Mapping operations
6.2.2. Types and visibility of attributes
6.2.3. Mapping classes, attributes and relationships
6.3. Mapping class diagram into database schema
6.3.1. Database management systems
6.3.2. Relational model
6.3.3. Mapping entity classes
6.3.4. Mapping relationships
6.4. Designing user interfaces
6.5. Case study

5. Học liệu (Textbooks)

5.1. Học liệu bắt buộc (Required Textbooks)

[1]. Mike O'Docherty, Object-Oriented Analysis and Design: Understanding System Development with UML 2.0, Publisher John Wiley & Sons, 2005

5.2. Học liệu tham khảo (Optional Textbooks)

[2]. A. Dennis, B. Wixom and D. Tegarden, System Analysis Design UML 2.0: an object-oriented approach, Publisher John Wiley & Sons, Fourth Edition, 2012

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
- Mid-term exercises/exams	10%	Individual
- Projects	20%	Group

- Final examination	60%	Individual

Trưởng Bộ môn **(Head of Department)**	**Giảng viên biên soạn** **(Lecturer)**
Nguyễn Mạnh Hùng	**Nguyễn Mạnh Hùng**