Object-Oriented Analysis and Design

Lecturer: Duc-Hanh Dang

General Information

- Dr. Duc-Hanh Dang

  - ❖ Office: Room 314-E3 (09:00, Thursday, by email)

  - ❖ Email: hanhdd@{vnu.edu.vn, gmail.com}

- TA: Tung-Lam Nguyen (tunglam@vnu.edu.vn)

- Class hour: 10:00 – 12:50 (Tuesday)

- Webcourse: https://courses.uet.vnu.edu.vn/

Professional Activities

- Research Interests

  - Software Modeling and Model Transformation

  - Automated Software Engineering

  - Software Quality

  - Formal Methods

- Research and Industrial Projects

  - SME lab

  - Blockchain lab

- Other activities

  - Reviewer, PC member for conferences/journals/...

  - Supervising graduate students and phd students

  - ...

Your Introduction

- About yourself

- Your background and experiences

  ➢ Object-oriented technology

  ➢ Software engineering

  ➢ Programming, ...

- Your expectations for the course ?

Motivation for the Course

- Software development is a hard task

  - More and more functions and responsibilities …

  - Distributed, concurrency, interacting with systems ...

- Code-centric approach: no longer suitable!

- Software should be captured from various views and at different levels of abstraction:

  - Why and What to development

  - Decisions of development

  - Providing features of proposed solutions

  - Defining a testing plan, ...

Motivation (2)

- Modeling languages like the Unified Modeling Language (UML) to specify, construct, visualize, and document the artifacts of a software system.

- Provide different diagrams to be flexibly applied.

- Modeling language is just a means to present ...

- We need a methodology and a process ...

  ➢ UML diagrams of the same kind (class diagram, sequence diagram, …) could be used in different situations and phases

Course Objectives

- Object-oriented paradiagm

- Apply the object-oriented methodology:

  ➢ Capture user requirement

  ➢ Analyze expected features of the system

  ➢ Design solutions for the features

  ➢ Realize solutions under certain constraints

- Document artifacts of the system using UML

Content

- Overview

  - Course Introduction

  - Best Practices of Software Engineering

  - Concepts of Object Orientation

- Requirement Overview

- Analysis and Design

- Architecture Analysis

- Use Case Analysis

Content

- Identify Design Elements

- Identify Design Mechanisms

- Describe the Run-time Architecture

- Describe Distribution

- Use Case Design

- Subsystem Design

- Class Design

- Database Design

Textbooks

Prescribed textbooks

❖ *Materials for the OOAD course of IBM*

❖ *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development.*
Craig Larman.

References

❖ *The Unified Modeling Language Reference Manual, 2nd Edition.* James Rumbaugh, Ivar Jacobson, and Grady Booch.

❖ *The Object Constraint Language: Getting Your Models Ready for MDA.* Anneke G. Kleppe, et. al.

❖ *Object-Oriented Software Engineering: A Use Case Driven Approach.* Ivar Jacobson.

Schedule

- 15 sessions and each session:

  - 02 hours for the lecture

  - 01 hour for group project

- Individual homework

  - answer 03 questions listed in each slide and hand it out (hardcopy) at the beginning of the next lecture.

- Group projects

  - 05 members (01 team leader)

  - proposed topics

- See the webcourse for a detail

Submit & Evaluate Group Projects

- Fill in the class board (gsheet) the group information (members, project title, …)

- Sharing your group project folder with the lecturer (hanhdd@gmail.com)

- Peer-review: each group is reviewed by two other groups. Preparing one gdocs/gsheet file for all assignments (shared only with the lecture):
  - ➤ to evaluate & comment assignments of two other groups
  - ➤ to obtain comments from reviewers (two other groups)

Assessment and Evaluation (tentative)

- Attendance, Homework and Attitude: 15%

- Assignments: 25%

- Final exam (closed book): 60%

Class Policy

- Actively participate Q/A on webcourse & piazza
  => get additional points

- Playing game / doing "private work" during class time
  => 01 absent

- Late / No assignment submission
  => get zero for the final grade

Any Questions?