# Software Engineering Experiment Guide

<Ver2.0>

**School of Computer Science**

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**History**

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| --- | --- | --- | --- |
| **Ver** | **Date** | **Author** | **Content** |
| Ver1.0 | 2018.3 | Xiaonan Zhao | Create according to the course syllabus |
| Ver1.0 | 2019.3 | Ning Li | Add Project Report Template |
|  |  |  |  |

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# Experiment Global Introduction

## Experiment List

**Table 1 Experiment List**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Content | Detailed Info | Type  （ratio） | Hours |
| 1 | Requirement analysis | Analyze user requirements and describe it in the software document correctly and completely. | Practice(20%) | 4 |
| 2 | Functional and detailed design | Based on analysis, write a design document via some appropriate design models and methods. | Practice(20%) | 4 |
| 3 | Code and test prepare | Practice reviewing code and writing test items. | Practice(20%) | 4 |
| 4 | Test and project | Practice typical testing approaches and writing test report. | Practice(20%) | 4 |
|  | Project | Design and implement a mini software project. | Comprehension  (20%) | extra |
| Total | | | 100% | 16+extra |

Note：The 4th experiment, that is to say project, students should focus on experiencing all the software development processes step by step. Students have 4 hours within the experiment class for it, and they need finish other works such as programming and testing with their extracurricular time. Furthermore, students are encouraged to accomplish a project with some other partners.

## Experiment Grade

The score of each experiment is 100, and we use the final weighted average grade as the final grade of this course.

|  |  |  |
| --- | --- | --- |
| **Item** | **requirement** | **percent** |
| attendance | Attend the course normally | 10% |
| experiment | The correctness, integrity and quality of the project documents and codes. | 70% |
| Project report | Correctly, clearly,completely | 20% |
| Total | | 100% |

## Experiment Requirement

1. Students should submit the electronic experimental report for each experiment. Experiment report file name format: SWE\_XXXXXX(StudentNo)\_Name.
2. Strictly abide by all disciplines of the laboratory.
3. Students should write down all the problems they have encountered during the experiment process, and describe how they solved the problems.

## Experiment Environment

There are no firmed limitations. Students can choose the development environment which they are most familiar with, in addition, they can make a decision according to the characters of the project which they have chosen and planned to accomplish.

# Experiment 1: Plan and Requirement

## Goal

1. To practice how to make a plan for a software development.
2. To practice how to consider the requirements from the user's viewpoint, and write qualified requirements analysis documents.

## Content

1. Read the provided document related to one incomplete prototype project carefully, try to understand the main design idea for the prototype project.
2. Analyze the demerits of the project and decide what component or functional module you want to add to the project.
3. Write a requirement document.

Project ------- Timestamp change tool (Determine your programming language) or other software

1. GUI (Graphic User Interface)

Analyze the demerits of the existed project document and decide what functions you want to add or change.

1. CLI (Command Line Interface)

Design the command line interface by yourself according to user’s requirements. (Example: windows basic command : dir )

Reference documents:

1. inventory system (all content)
2. flight management(Software Requirement Specification)
3. webapp(Software Requirement Specification)

Optional project list:

1. Calculator
2. Timestamp change tool
3. Library management system
4. Flight booking system
5. Course management system
6. ....

# Experiment 2: Functional and Detailed Design

## Goal

1.To practice how to design a project.

2.To practice how to apply some design tools when writing design documents.

## Content

1. Write functional design document according to the requirement document you have finished. In the document, apply the UML tool to draw the class diagram, sequence diagram and other diagrams which are possible useful in your design document.
2. Write detailed design document based on your functional design document.
3. (You can choose to accomplish this one instead of 1.) Try to write the given project’s design document and choose one part to redesign. Then write the functional design and detailed design document for your added part.

Note: Please pay attention to the detailed design: you must write it detail enough. That is to say, it should include all the function definitions, such as the function name, parameter list, main variables and core algorithms.

# Experiment 3: Code and Test Prepare

## Goal

1. To practice how to code for a project.

2. To practice how to design test items.

3. To practice the process of review code in a team(optional).

## Content

1. Try to code based on a given detailed design document.
2. Write unit test items according to the detailed design document and code.
3. Practice the exchange review with the other group members in your team.

# Experiment 4: Test and Project

## Goal

1. To practice how to test a project using some typical test approaches we have learned in the course.
2. Do some preparation for your own project.

## Content

1. Execute the unit test for your designed component in the given project
2. Design functional test items and do the functional test to check your functional design.
3. Write the complete development document for your final project.

Note:

There no limitation for the project chosen. But you’d better plan and accomplish a software project with several other students. Such kind of development form will help to experience team work and understand some concepts we have learned in the course deeper.

# Project Report Template

This template can be used for documenting a complete software development project.

Please extend or tailor it according to the practical software size or special requirement.

But the following sections marked with “\*“must be filled:

Chapter1 Development plan

1.1 Introduction \*

1.2 Developing tools and environment\*

1.3 Project Management\*

1.4 Software life cycle model

1.5 Glossary

Chapter2 Requirement analysis

2.1 Introduction \*

2.2 Functional requirements \*

2.3 Nonfunctional requirements

Chapter3 System and function design

3.1 System architecture \*

3.2 Use case diagram \*

3.3 Package/Module diagram

3.4 Functional description \*

3.5 Nonfunctional description

3.6 Data description

Chapter4 Detail design

4.1 Class diagram \*

4.2 ClassA/ModelA \*

Chapter5 Programming

5.1 Coding rules \*

5.2 Techniques in programming

5.3 Difficulties in programming

Chapter6 Testing

6.1 Test plan

6.2 Unit test \*

6.3 Function test \*

6.4 System test

Chapter7 Summary

7.1 Project summary\*

7.2 Techniques summary \*