**MINISTRY OF EDUCATION AND TRAINING**

|  |
| --- |
| **FPT UNIVERSITY** |
| **Capstone Project Document** |
| **Course-Scheduling** |
|  |
| |  |  | | --- | --- | | **Course Scheduling Team** | | | **Group Member** | Nguyễn Sơn Hà – SE02618  Hoàng Minh Đức – SE02551  Lưu Thành Công – SE02543  Nguyễn Văn Hoài – SE90191 | | **Supervisor** | Nguyễn Tất Trung  Phạm Quang Dũng | | **Capstone Project code** | CourseScheduling |   Hanoi, 24/5/2015 Acknowledgements |

# Definitions and Acronyms

# Contents

[Acknowledgements 2](#_Toc421134246)

[Definitions and Acronyms 2](#_Toc421134247)

[Contents 3](#_Toc421134248)

[1 CHAPTER 1: INTRODUCTION 4](#_Toc421134249)

[1.1 Purpose 4](#_Toc421134250)

[1.2 Project Information 4](#_Toc421134251)

[1.3 The People 4](#_Toc421134252)

[1.3.1 Supervisor 4](#_Toc421134253)

[1.3.2 Team members 5](#_Toc421134254)

[1.4 Background 6](#_Toc421134255)

[1.5 Literature Review 6](#_Toc421134256)

[1.6 Ideas 6](#_Toc421134257)

[1.7 Proposal of System 6](#_Toc421134258)

[1.7.1 Our proposal system 6](#_Toc421134259)

[1.7.2 Introduction about our proposal system 6](#_Toc421134260)

[2 Chapter 2. Project Management Plan 7](#_Toc421134261)

[2.1 Purpose 7](#_Toc421134262)

[2.2 Project Organization 7](#_Toc421134263)

[2.2.1 Our Proposal System 7](#_Toc421134264)

[2.2.2 Roles and Responsibility 7](#_Toc421134265)

[2.3 Project Management Plan 9](#_Toc421134266)

[2.3.1 Task 9](#_Toc421134267)

[2.3.2 Meeting Minutes 9](#_Toc421134268)

[2.3.3 Coding Conventions 9](#_Toc421134269)

[2.3.4 Risk Management Plan 10](#_Toc421134270)

[2.3.5 Risk probability and impact 11](#_Toc421134271)

[2.3.6 Communication Plan 11](#_Toc421134272)

[3 CHAPTER 3. SOFTWARE REQUIREMENT SPECIFICATION 12](#_Toc421134273)

[3.1 Purpose 12](#_Toc421134274)

[3.2 Functional Requirements 12](#_Toc421134275)

[3.2.1 Use Cases Diagram 12](#_Toc421134276)

[3.2.2 Use Cases List 12](#_Toc421134277)

[3.2.3 Business Rules 14](#_Toc421134278)

[3.2.4 Use Cases 15](#_Toc421134279)

[3.3 Non-functional Requirements 27](#_Toc421134280)

[3.3.1 Security 27](#_Toc421134281)

[3.3.2 Maintainability & Extensibility 27](#_Toc421134282)

[3.3.3 Performance 27](#_Toc421134283)

[3.4 Entity Relationship Diagram 28](#_Toc421134284)

# CHAPTER 1: INTRODUCTION

## Purpose

The introduction chapter provides main information of project about team’s members and project’s objectives.

## Project Information

* Project name: **Course-Scheduling**
* Project code: **Course-Scheduling**
* Project group name **:**
* Product type: **Website Application**
* Timeline: **From 10th May 2015 to 30thAug 2015**

## The People

### Supervisor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Full name** | **Phone** | **E-Mail** | **Title** |
| Supervisor | Nguyễn Tất Trung | 0904399139 | [*trungnt@fpt.edu.vn*](mailto:trungnt@fpt.edu.vn) | Lecturer |
| Supervisor | Phạm Quang Dũng | 0947732280 | [*dungpq1@fsoft.com.vn*](mailto:dungpq1@fsoft.com.vn) |  |

*Table 1.1: Supervisor information*

### Team members

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Full name** | **Student code** | **Phone** | **E-mail** | **Role in Group** |
| 1 | **Nguyễn Sơn Hà** | SE02618 | 0945488693 | [*hansse02618@fpt.edu.vn*](mailto:hansse02618@fpt.edu.vn) | Leader |
| 2 | **Hoàng Minh Đức** | SE02551 | 0904634667 | [*duchmse02551@fpt.edu.vn*](mailto:duchmse02551@fpt.edu.vn) | Member |
| 3 | **Lưu Thành Công** | SE02543 | 01656083093 | [*congltse02543@fpt.edu.vn*](mailto:congltse02543@fpt.edu.vn) | Member |
| 4 | **Nguyễn Văn Hoài** | SE90191 | 01659029841 | [*hoainvse90901@fpt.edu.vn*](mailto:hoainvse90901@fpt.edu.vn) | Member |

*Table 1-2: Team member’s information*

## Background

## Literature Review

## Ideas

Scheduling Courses is always one of the hardest work for FPT University because of conflicts about time of teachers and the change of timetable in every semester. Our project will apply algorithms to do this work automatically by computer and also provide a tool to help them create timetable easer in the website.

## Proposal of System

### Our proposal system

### Introduction about our proposal system

# Chapter 2. Project Management Plan

## Purpose

This chapter describes about project team’s structure and plan of the project. All members will use this chapter as a guideline to work in this project.

## Project Organization

### Our Proposal System

This figure above describes the information and products flow lifecycle process model. Course-Scheduling project uses the Iterative and Incremental Software Process Model.

The Iterative and Incremental Software Process Model is most use when the scope of the project is big, the major requirements were defined clearly, some more detail will be added in time, and for the newbie group in software development. By using this software process model, we break down the developing system task into series of smaller tasks which be completed separately, evaluated, and subsequently re-worked until the system’s performance adequately. In addition, the iterative model is easier than other models when the issues are discovered. They are fed back to the team, and solutions found while the project is still in development.

### Roles and Responsibility

#### Organization Structure

|  |  |
| --- | --- |
| **Role** | **Responsibility** |
| Project Manager | Planning and defining scope, developing schedules, allocating resources, coordinating communication, generally responsible for keeping the team’s focus on main goal, and tries to keep the project team focused on the right goal at a time. |
| Technical Leader | Responsible for the underlying architecture for the software program, assigning tasks, mentoring people, reporting and updating regular associates RAG status. Also technical leader is a reference book for other software programmers. |
| Business Analyst | Eliciting requirement, analyzing and documenting requirements, communicate requirements, identifying solution and verifying solution meets the requirements, leads and coordinates use-case modeling. Outline the system’s functionality. |
| Test Leader | Responsible for test execution, including test set-up and test run, evaluation of test run and error recovery, defect logging and test results recording. |
| Developer | Involve to code product |
| Designer | Involve to design product |
| Tester | Involve to test product |

#### Project Team Members

|  |  |
| --- | --- |
| **Team Member** | **Role** |
| HaNS | Project Manager, Developer, Tester, Designer |
| DucHM | Technical Leader, Test Leader, Developer, Tester, Designer |
| CongLT | Business Analyst, Developer, Tester |
| HoaiNV | Business Analyst, Developer, Tester |

#### Tools and Techniques

* **Programming languages:** Java, HTML5, CSS3, JQuery.
* **Framework:** MVC Spring
* **Software Architecture:** Web Service (REST architecture).
* **Process Model:** Iterative and Incremental Software Process Model.
* **Version Control:** Github.
* **IDEs**: Spring Tool Suite
* **DBMS**: MySQL v5.5
* **UML tools:** Enterprise Architect v12, Astah Professional v6.9.0
* **Manage tools:**  Microsoft Project Professional 2013.
* **Web server:** Apache2.0.

## Project Management Plan

### Task

Refer to file Course-Scheduling.mpp

### Meeting Minutes

All meeting minutes will be written follow this template:

| ***Meeting/Project Name:*** | *CourseScheduling* | | | | |
| --- | --- | --- | --- | --- | --- |
| ***Date of Meeting:*** | *01/06/2015* | | ***Time: (Type)*** | *3 hours (Skype)* | |
| ***Meeting Called By:*** | *HaNS* | | ***Location:*** | *B109* | |
| ***Note Taker:*** | *DucHM* | | ***Time Keeper:*** | *CongLT* | |
| 1. Meeting Objective: | | | | | |
| Brainstorming all functions of systems | | | | | |
| 2. Attendance | | | | | |
| ***Name*** | ***Roles*** | ***E-mail*** | | | ***Phone*** |
| Nguyen Son Ha | Project Manager | [hansse02618@fpt.edu.vn](mailto:hansse02618@fpt.edu.vn) | | | 0945488693 |
| Hoang Minh Duc | Technical Leader, Test Leader | [duchmse02551@fpt.edu.vn](mailto:duchmse02551@fpt.edu.vn) | | | 0904634667 |
| Luu Thanh Cong | Business Analyst | [congltse02543@fpt.edu.vn](mailto:congltse02543@fpt.edu.vn) | | | 01656083093 |
| Nguyen Van Hoai | Business Analyst | [hoainvse90191@fpt.edu.vn](mailto:hoainvse90191@fpt.edu.vn) | | | 01659029841 |
| 3. Content: | | | | | |
|  | | | | | |

### Coding Conventions

Follow Java coding convention. See the reference for detail:

<http://www.oracle.com/technetwork/java/codeconvtoc-136057.html>

### Risk Management Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Root Cause** | **Avoidance plan** | **Contingency** |
| R1 | **Member**  **un-cooperating** | Conflict between team members. | Team building to connect member with each others. | Finding root conflict (social relationship, private conflict) |
| R2 | **Team member do not have enough appropriate skill, experience** | All member are students. | When developing project plan, estimating more time for study new technique. | Trying to contact with expertise to learn from their experience and get their advices. |
| R3 | **Changing in the way of executing** | Creative members. |  | Meeting for evaluating, and changing the way to execute the project if it's really better. |
| R4 | **Over deadline** | Low responsibility in working of members | Estimate time to plan task appropriate with ability of team members and hold daily meeting to keep track on project status day by day. | Other team members will support to help the task can complete in time. |
| R5 | **Low quality infrastructure of the internet** | Incident |  | Use other internet like 3G. |
| R6 | **Lack of real data** | Can not contact with people who can provide team the real data. |  | Create dummy data based on the knowledge about this business of team members. |

### Risk probability and impact

High

|  |  |  |
| --- | --- | --- |
|  | R5 |  |
|  | R1 | R4 |
| R3 | R2 | R6 |

Probability

Medium

Low

High

Medium

Low

Impact

*Figure 2.2. Risk probability and impact*

### Communication Plan

*Weekly meeting schedule:* By using Iterative and Incremental Process Model, Footprints Project system will be divided into a series of small tasks, each task will be assigned to team members by Technical Leader and depend on difficulty, and Technical Leader will assign deadlines for each task. We will have meeting every Tuesday and Thursday to keep track about our works in a week then discuss about the tasks we have to done in next week.

*Unscheduled meeting*: If any unplanned or important situation happened, we have to hold a meeting to find solution or discuss about what we need to do in this situation.

*Communication channel*: Our main communication channels are face-to-face meeting, e-mail and Facebook.

# CHAPTER 3. SOFTWARE REQUIREMENT SPECIFICATION

## Purpose

## Functional Requirements

### Use Cases Diagram

Admin, Staff, Teacher, Student

### Use Cases List

|  |  |
| --- | --- |
| Primary Actor | Use Cases |
| Admin, Staff, Teacher, Student | UC-01. Login |
| Admin, Staff, Teacher, Student | UC-02. Logout |
| Admin | UC-03. View All Staffs |
| Admin | UC-04. Add Staff |
| Admin | UC-05. Remove Staff |
| Admin | UC-06. Search Staffs |
| Admin | UC-07. View Staff’s Information Detail |
| Staff | UC-08. View All Rooms |
| Staff | UC-09. Add Room |
| Staff | UC-10. Add List of Rooms |
| Staff | UC-11. Update Room |
| Staff | UC-12. Remove Room |
| Staff | UC-13. Search Rooms |
| Staff | UC-14. View Room’s Information Detail |
| Staff | UC-15. View All Semesters |
| Staff | UC-16. Add Semester |
| Staff | UC-17. Update Semester |
| Staff | UC-18. Search Semester |
| Staff | UC-19. View Semester’s Information Detail |
| Staff | UC-20. View All Teachers |
| Staff | UC-21. Add Teacher |
| Staff | UC-22. Add List of Teachers |
| Staff | UC-23. Update Teacher |
| Staff | UC-24. Remove Teacher |
| Staff | UC-25. De-active Teacher |
| Staff | UC-26. Search Teachers |
| Staff | UC-27. View Teacher’s Information Detail |
| Staff | UC-28. View All Students |
| Staff | UC-29. Add Student |
| Staff | UC-30. Add List of Students |
| Staff | UC-31. Update Student |
| Staff | UC-32. Remove Student |
| Staff | UC-33. De-active Student |
| Staff | UC-34. Search Students |
| Staff | UC-35. View Student’s Information Detail |
| Staff | UC-36. View All Courses |
| Staff | UC-37. Add Course |
| Staff | UC-38. Add List of Courses |
| Staff | UC-39. Update Course |
| Staff | UC-40. Remove Course |
| Staff | UC-41. Search Courses |
| Staff | UC-42. View Course’s Information Detail |
| Staff | UC-43. View All Classes |
| Staff | UC-44. Add Class |
| Staff | UC-45. Add List of Classes |
| Staff | UC-46. Update Class |
| Staff | UC-47. Remove Class |
| Staff | UC-48. Search Classes |
| Staff | UC-49. View Class’s Information Detail |
| Admin, Staff, Teacher, Student | UC-50. Update User’s Information |
| Staff | UC-51. Change Student’s Semester |
| Staff | UC-52. Update Student’s Learning Progress |
| Staff | UC-53. Student into Classes |
| Student | UC-54. Register Courses |
| Staff | UC-55. Create Timetable |
| Staff, Teacher | UC-56. Choose Teachers for Classes |
| Admin, Staff | UC-57. View All Timetable |
| Teacher, Student | UC-58. View Personal Timetable |
| Teacher | UC-59. View A Class Timetable |

### Business Rules

|  |  |
| --- | --- |
| **No** | **Description** |
| **B1** | The account must not be empty |
| **B2** | The account must be the account of mail |
| **B3** | The e-mail must not be empty |
| **B4** | The e-mail must be fpt university’s mail (fpt.edu.vn) |
| **B5** | Room’s code |
| **B6** | Room’s type |
| **B7** | Room’s capacity |
| **B8** | Semester’s Code |
| **B9** | Semester’s Name |
| **B10** | Semester’s Finish Date |

### Use Cases

#### Admin

##### UC-01. Login

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-01. Login | | |
| Created By: |  | Date Created: |  |
| Primary Actor: |  | Secondary Actors: |  |
| Trigger: |  | | |
| Description: |  | | |
| Pre-conditions: |  | | |
| Post-conditions: |  | | |
| Normal Flow: |  | | |
| Alternative Flows: |  | | |
| Exceptions: |  | | |
| Priority: |  | | |
| Frequency of Use: |  | | |
| Business Rules: |  | | |
| Other Information: |  | | |
| Assumptions: |  | | |

##### UC-02. Logout

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-02. Logout | | |
| Created By: |  | Date Created: |  |
| Primary Actor: |  | Secondary Actors: |  |
| Trigger: |  | | |
| Description: |  | | |
| Pre-conditions: |  | | |
| Post-conditions: |  | | |
| Normal Flow: |  | | |
| Alternative Flows: |  | | |
| Exceptions: |  | | |
| Priority: |  | | |
| Frequency of Use: |  | | |
| Business Rules: |  | | |
| Other Information: |  | | |
| Assumptions: |  | | |

##### UC-03. View All Staffs

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-03. View All Staffs | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin** | Secondary Actors: | N/A |
| Trigger: | The actor wants to see all the staffs. | | |
| Description: | Actor uses this function to see all the staffs. | | |
| Pre-conditions: | **PRE – 03.01.** Actor is logged to Course-Scheduling Website.  **PRE – 03.02.** Actor is set as the admin of the Website. | | |
| Post-conditions: | **POST – 03.01.** Course-Scheduling shows list of all staffs. | | |
| Normal Flow: | **UC – 03. View All Staffs**   1. Actor clicks to tab “Staff”. 2. Course-Scheduling shows list of all Staffs. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **03.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-04. Add Staff

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-04. Add Staff | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin** | Secondary Actors: | N/A |
| Trigger: | The actor wants to add new staff to use the web. | | |
| Description: | Actor uses this function to add new staff to use the web. | | |
| Pre-conditions: | **PRE – 04.01.** Actor is logged to Course-Scheduling Website.  **PRE – 04.02.** Actor is set as the admin of the Website.  **PRE – 04.03.** Actor accessed to Staff page. | | |
| Post-conditions: | **POST – 04.01.** The staff was added will be shown in list of all staffs of Staff page. | | |
| Normal Flow: | **UC – 04. Add Staff**   1. In Staff page, Actor clicks to button "Add Staff”. 2. The actor enters information about new staff: “Account”, “Name”, “E-mail”, “Account Type”. 3. Course-Scheduling will validate all information, if it’s correct, the staff will be added to database. 4. Course-Scheduling redirects to Staff page with message “Add Staff Successful.”. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **04.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **B1, B2, B3, B4** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-05. Remove Staff

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-05. Remove Staff | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin** | Secondary Actors: | N/A |
| Trigger: | The actor wants to remove a staff. | | |
| Description: | Actor uses this function to remove a staff. | | |
| Pre-conditions: | **PRE – 05.01.** Actor is logged to Course-Scheduling Website.  **PRE – 05.02.** Actor is set as the admin of the Website.  **PRE – 05.03.** Actor accessed to Staff page. | | |
| Post-conditions: | **POST – 05.01.** The staff was removed must not be shown in list of all staffs of Staff page. | | |
| Normal Flow: | **UC – 05. Remove Staff**   1. Actor clicks to a staff in list of staffs. 2. Course-Scheduling shows a dialog for actor to choose “View”, “Remove” or “Cancel”. 3. Actor chooses “Remove”. 4. Course-Scheduling asks for confirmation to remove this staff. 5. Actor chooses “Accept” 6. Course-Scheduling removes this staff in database. 7. Course-Scheduling redirects to Staff page with message “Remove Staff Successful.”. | | |
| Alternative Flows: | **AF – 05.01. At step 3, Actor chooses “Cancel”**   1. Actor chooses “Cancel” in the dialog. 2. Course-Scheduling redirects to Staff page.   **AF – 05.02. At step 3, Actor chooses “View”**   1. Refer UC-07.   **AF – 05.03. At step 5, Actor chooses “Decline”**   1. Actor chooses “Decline” in the dialog. 2. Course-Scheduling redirects to Staff page. | | |
|  | **05.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-06. Search Staffs

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-06. Search Staff | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin** | Secondary Actors: | N/A |
| Trigger: | The actor wants to search for a specific staff. | | |
| Description: | Actor uses this function to search for a specific staff in the website. | | |
| Pre-conditions: | **PRE – 06.01.** Actor is logged to Course-Scheduling Website.  **PRE – 06.02.** Actor is set as the admin of the Website.  **PRE – 06.03** Actor accessed to Staff page. | | |
| Post-conditions: | **POST – 06.01.** The staffs have information similar with the information that actor entered will be shown. | | |
| Normal Flow: | **UC – 06. Search** **Staff**   1. Actor enters information about the staff that they want to find. 2. Course-Scheduling shows list of staffs that have this information. | | |
| Alternative Flows: | **AF – 07. At Step 3.** | | |
| Exceptions: | **06.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-07. View Staff’s Information Detail

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-07. View Staff’s Information Detail | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin** | Secondary Actors: | N/A |
| Trigger: | The actor wants to view information of a specific staff. | | |
| Description: | Actor uses this function to information of a specific staff. | | |
| Pre-conditions: | **PRE – 07.01.** Actor is logged to Course-Scheduling Website.  **PRE – 07.02.** Actor is set as the admin of the Website.  **PRE – 07.03.** Actor accessed to Staff page. | | |
| Post-conditions: | **POST – 07.01.** The information of this staff will be shown to actor. | | |
| Normal Flow: | **UC – 07. View Staff’s Information Detail**   1. Actor clicks to a staff in list of staffs. 2. Course-Scheduling shows a dialog for actor to choose “View”, “Remove” or “Cancel”. 3. Actor chooses “View”. 4. Course-Scheduling shows a dialog with detail information of this staff. 5. Actor choose “Close” 6. Course-Scheduling closes the dialog. | | |
| Alternative Flows: | **AF – 07. Step 3.**  Refer to AF – 05.01 for “Cancel” and UC – 05 for “Remove”. | | |
| Exceptions: | **07.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-08. View All Rooms

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-08. View All Rooms | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to see all the rooms. | | |
| Description: | Actor uses this function to see all the rooms. | | |
| Pre-conditions: | **PRE – 08.01.** Actor is logged to Course-Scheduling Website.  **PRE – 08.02.** Actor is set as the admin or staff of the Website. | | |
| Post-conditions: | **POST – 08.01.** Course-Scheduling shows list of all rooms. | | |
| Normal Flow: | **UC – 08. View All Staffs**   1. Actor clicks to tab “Room”. 2. Course-Scheduling shows list of all Rooms. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **08.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-09. Add Room

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-09. Add Room | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to add new room. | | |
| Description: | Actor uses this function to add new room. | | |
| Pre-conditions: | **PRE – 09.01.** Actor is logged to Course-Scheduling Website.  **PRE – 09.02.** Actor is set as the admin, staff of the Website.  **PRE – 09.03.** Actor accessed to room page. | | |
| Post-conditions: | **POST – 09.01.** The room was added will be shown in list of all staffs of Staff page. | | |
| Normal Flow: | **UC – 09. Add Staff**   1. In Room page, Actor clicks to button "Add Room”. 2. The actor enters information about new staff: “Code”, “Room Type”, “Capacity”. 3. Course-Scheduling will validate all information, if it’s correct, the Room be added to database. 4. Course-Scheduling redirects to Room page with message “Add Staff Successful.”. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **09.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **B5, B6, B7** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-10. Add List of Rooms

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-10. Add List of Rooms | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to add List of new room. | | |
| Description: | Actor uses this function to add List of new room. | | |
| Pre-conditions: | **PRE – 09.01.** Actor is logged to Course-Scheduling Website.  **PRE – 09.02.** Actor is set as the admin, staff of the Website.  **PRE – 09.03.** Actor accessed to room page. | | |
| Post-conditions: | **POST – 09.01.** The rooms was added will be shown in list of all staffs of Staff page. | | |
| Normal Flow: | **UC – 09. Add List of Rooms**   1. In Room page, Actor clicks to button "Add List of Rooms”. 2. Course-Scheduling shows a dialog with an input to enter the link of excel file contains all information about rooms. 3. Actor enters the link of file. 4. Actor choose “Import”. 5. Course-Scheduling will validate all information, if it’s correct, the Rooms be added to database. 6. Course-Scheduling redirects to Room page with a message “Import List of Rooms successful.“. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **09.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **B5, B6, B7** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-11. Update Room

##### UC-12. Remove Room

Room

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-12. Remove Room | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to remove a room. | | |
| Description: | Actor uses this function to remove a room. | | |
| Pre-conditions: | **PRE – 12.01.** Actor is logged to Course-Scheduling Website.  **PRE – 12.02.** Actor is set as the admin or staff of the Website.  **PRE – 12.03.** Actor accessed to Room page. | | |
| Post-conditions: | **POST – 12.01.** The room was removed must not be shown in list of all staffs of Staff page. | | |
| Normal Flow: | **UC – 12. Remove Room**   1. Actor clicks to a room in list of rooms. 2. Course-Scheduling shows a dialog for actor to choose “View”, “Remove” or “Cancel”. 3. Actor chooses “Remove”. 4. Course-Scheduling asks for confirmation to remove this room. 5. Actor chooses “Accept” 6. Course-Scheduling removes this room in database. | | |
| Alternative Flows: | **AF – 12.01. At step 3, Actor chooses “Cancel”**   1. Actor chooses “Cancel” in the dialog. 2. Course-Scheduling redirects to Room page.   **AF – 12.02. At step 3, Actor chooses “View”**   1. Refer UC-14.   **AF – 12.03. At step 5, Actor chooses “Decline”**   1. Actor chooses “Decline” in the dialog. 2. Course-Scheduling redirects to Room page. | | |
|  | **05.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-13. Search Rooms

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-13. Search Room | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to search for a specific room. | | |
| Description: | Actor uses this function to search for a specific room. | | |
| Pre-conditions: | **PRE – 13.01.** Actor is logged to Course-Scheduling Website.  **PRE – 13.02.** Actor is set as the admin or staff of the Website.  **PRE – 13.03** Actor accessed to Room page. | | |
| Post-conditions: | **POST – 13.01.** The rooms have information similar with the information that actor entered will be shown. | | |
| Normal Flow: | **UC – 13. Search** **Room**   1. Actor enters information about the room that they want to find. 2. Course-Scheduling shows list of rooms that have this information. | | |
| Alternative Flows: | **N/A** | | |
| Exceptions: | **06.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-14. View Room’s Information Detail

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-14. View Room’s Information Detail | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to view information of a specific room. | | |
| Description: | Actor uses this function to information of a specific room. | | |
| Pre-conditions: | **PRE – 14.01.** Actor is logged to Course-Scheduling Website.  **PRE – 14.02.** Actor is set as the admin or staff of the Website.  **PRE – 14.03.** Actor accessed to Room page. | | |
| Post-conditions: | **POST – 14.01.** The information of this room will be shown to actor. | | |
| Normal Flow: | **UC – 14. View Room’s Information Detail**   1. Actor clicks to a room in list of rooms. 2. Course-Scheduling shows a dialog for actor to choose “View”, “Remove” or “Cancel”. 3. Actor chooses “View”. 4. Course-Scheduling shows a dialog with detail information of this room. 5. Actor choose “Close” 6. Course-Scheduling closes the dialog. | | |
| Alternative Flows: | **AF – 14. Step 3.**  Refer to AF – 12.01 for “Cancel” and UC – 12 for “Remove”. | | |
| Exceptions: | **07.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-15. View All Semesters

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-15. View All Semesters | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to see all the Semesters. | | |
| Description: | Actor uses this function to see all the Semesters. | | |
| Pre-conditions: | **PRE – 15.01.** Actor is logged to Course-Scheduling Website.  **PRE – 15.02.** Actor is set as the admin of the Website. | | |
| Post-conditions: | **POST – 15.01.** Course-Scheduling shows list of all Semesters. | | |
| Normal Flow: | **UC – 15. View All** Semesters   1. Actor clicks to tab “Semester”. 2. Course-Scheduling shows list of all Semesters. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **15.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-16. Add Semester

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-16. Add Semester | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to add new Semester. | | |
| Description: | Actor uses this function to add new Semester. | | |
| Pre-conditions: | **PRE – 16.01.** Actor is logged to Course-Scheduling Website.  **PRE – 16.02.** Actor is set as the admin or staff of the Website.  **PRE – 16.03.** Actor accessed to Semester page. | | |
| Post-conditions: | **POST – 16.01.** The staff was added will be shown in list of all Semesters of Semester page. | | |
| Normal Flow: | **UC – 16. Add Semester**   1. In Semester page, Actor clicks to button "Add Semester”. 2. The actor enters information about new Semester: “Code”, “Name”, “Year”, “Start Date”, “Finish Date”. 3. Course-Scheduling will validate all information, if it’s correct, the Semester will be added to database. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **16.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Low** | | |
| Business Rules: | **B8, B9, B10** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-17. Update Semester

##### UC-18. Search Semester

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-18. Search Semester | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to search for a specific Semester. | | |
| Description: | Actor uses this function to search for a specific Semester in the website. | | |
| Pre-conditions: | **PRE – 18.01.** Actor is logged to Course-Scheduling Website.  **PRE – 18.02.** Actor is set as the admin or staff of the Website.  **PRE – 18.03** Actor accessed to Semester page. | | |
| Post-conditions: | **POST – 18.01.** The Semesters have information similar with the information that actor entered will be shown. | | |
| Normal Flow: | **UC – 18. Search** **Staff**   1. Actor enters information about the Semester that they want to find. 2. Course-Scheduling shows list of Semesters that have this information. | | |
| Alternative Flows: | **AF – 18. At Step 3.** | | |
| Exceptions: | **18.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-19. View Semester’s Information Detail

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-19. View Semester’s Information Detail | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to view information of a specific Semester. | | |
| Description: | Actor uses this function to information of a specific Semester. | | |
| Pre-conditions: | **PRE – 19.01.** Actor is logged to Course-Scheduling Website.  **PRE – 19.02.** Actor is set as the admin or staff of the Website.  **PRE – 19.03.** Actor accessed to Semester page. | | |
| Post-conditions: | **POST – 19.01.** The Semesters have information similar with the information that actor entered will be shown. | | |
| Normal Flow: | **UC – 19. View Semester’s Information Detail**   1. Actor clicks to a Semester in list of Semesters. 2. Course-Scheduling shows a dialog with detail information of this Semester. 3. Actor choose “Close” 4. Course-Scheduling closes the dialog. | | |
| Alternative Flows: | **N/A** | | |
| Exceptions: | **19.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-20. View All Teachers

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-20. View All Teachers | | |
| Created By: | **HaNS** | Date Created: | **2015-06-01** |
| Primary Actor: | **Admin, Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to see all the Teachers. | | |
| Description: | Actor uses this function to see all the Teachers. | | |
| Pre-conditions: | **PRE – 20.01.** Actor is logged to Course-Scheduling Website.  **PRE – 20.02.** Actor is set as the admin or staff of the Website. | | |
| Post-conditions: | **POST – 20.01.** Course-Scheduling shows list of all Teachers. | | |
| Normal Flow: | **UC – 20. View All Teachers**   1. Actor clicks to tab “Teacher”. 2. Course-Scheduling shows list of all Teachers. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **20.01. Can not connect to server.**  **1.** Course-Scheduling shows a dialog with error message “**Can not connect to server**” and a “**Back**” button.  **2.** Actor clicks “**Back”** button and website reload the previous page. | | |
| Priority: | **Medium** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-21. Add Teacher

##### UC-22. Add List of Teachers

##### UC-23. Update Teacher

##### UC-24. Remove Teacher

##### UC-25. De-active Teacher

##### UC-26. Search Teachers

##### UC-27. View Teacher’s Information Detail

##### UC-28. View All Students

##### UC-29. Add Student

##### UC-30. Add List of Students

##### UC-31. Update Student

##### UC-32. Remove Student

##### UC-33. De-active Student

##### UC-34. Search Students

##### UC-35. View Student’s Information Detail

##### UC-36. View All Courses

##### UC-37. Add Course

##### UC-38. Add List of Courses

##### UC-39. Update Course

##### UC-40. Remove Course

##### UC-41. Search Courses

##### UC-42. View Course’s Information Detail

##### UC-43. View All Classes

##### UC-44. Add Class

##### UC-45. Add List of Classes

##### UC-46. Update Class

##### UC-47. Remove Class

##### UC-48. Search Classes

##### UC-49. View Class’s Information Detail

##### UC-50. Update User’s Information

##### UC-51. Change Student’s Semester

##### UC-52. Update Student’s Learning Progress

##### UC-53. Auto put students into class(es)

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-53. Auto put students into class(es) | | |
| Created By: | **DucHM** | Date Created: | **2015-07-16** |
| Primary Actor: | **Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to automatically put students into classes. | | |
| Description: | Actor uses this function to automatically put students into classes. | | |
| Pre-conditions: | **PRE – 53.01.** Actor is logged to Course-Scheduling Website.  **PRE – 53.02.** Actor is set as the staff of the Website. | | |
| Post-conditions: | **POST – 53.01.** Students were put into classes. | | |
| Normal Flow: | **UC – 53. Auto put students into class(es)**   1. Actor clicks to “Manage ClassSemesters” link. 2. Actor clicks to “Auto put students into class” or “Auto put all students into classes” 3. Course-Scheduling auto puts all suitable students into class(es). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **53.01. Unexpected exception.**  **1.** Course-Scheduling shows error message.  **2.** Rollback transaction. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-54. Manual put student into class

|  |  |  |  |
| --- | --- | --- | --- |
| UC ID and Name: | UC-54. Manual put student into class | | |
| Created By: | **DucHM** | Date Created: | **2015-07-16** |
| Primary Actor: | **Staff** | Secondary Actors: | N/A |
| Trigger: | The actor wants to put a student into a class. | | |
| Description: | Actor uses this function to put a student into a class. | | |
| Pre-conditions: | **PRE – 54.01.** Actor is logged to Course-Scheduling Website.  **PRE – 54.02.** Actor is set as the staff of the Website. | | |
| Post-conditions: | **POST – 54.01.** Student was put into class. | | |
| Normal Flow: | **UC – 54. Manual put student into class**   1. Actor clicks to “Manage ClassCourseStudentSemesters” link. 2. Actor Select semester, class & course(s) 3. Actor select a student from suitable students list to put into class. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **54.01. Max Student Number Exception.**  **1.** Course-Scheduling shows error message: “Student number of this class exceed 30”.  **2.** Rollback transaction. | | |
| Priority: | **High** | | |
| Frequency of Use: | **Medium** | | |
| Business Rules: | **N/A** | | |
| Other Information: | **N/A** | | |
| Assumptions: | **N/A** | | |

##### UC-55. Create Timetable

##### UC-56. Choose Teachers for Classes

##### UC-57. View All Timetable

##### UC-58. View Personal Timetable

##### UC-59. View Timetable of A Class

## Non-functional Requirements

### Security

### Maintainability & Extensibility

### Performance

## Entity Relationship Diagram

# CHAPTER 4: SOFTWARE DESIGN

## Purpose

## Architecture Overview

### System Architecture

### System Architecture Explanation

## Design of CourseScheduling system

### Architecture Layers Design

### Database Design

#### Database Diagram

### Common Design

### Detail Design