PART 1: PROJECT PLAN

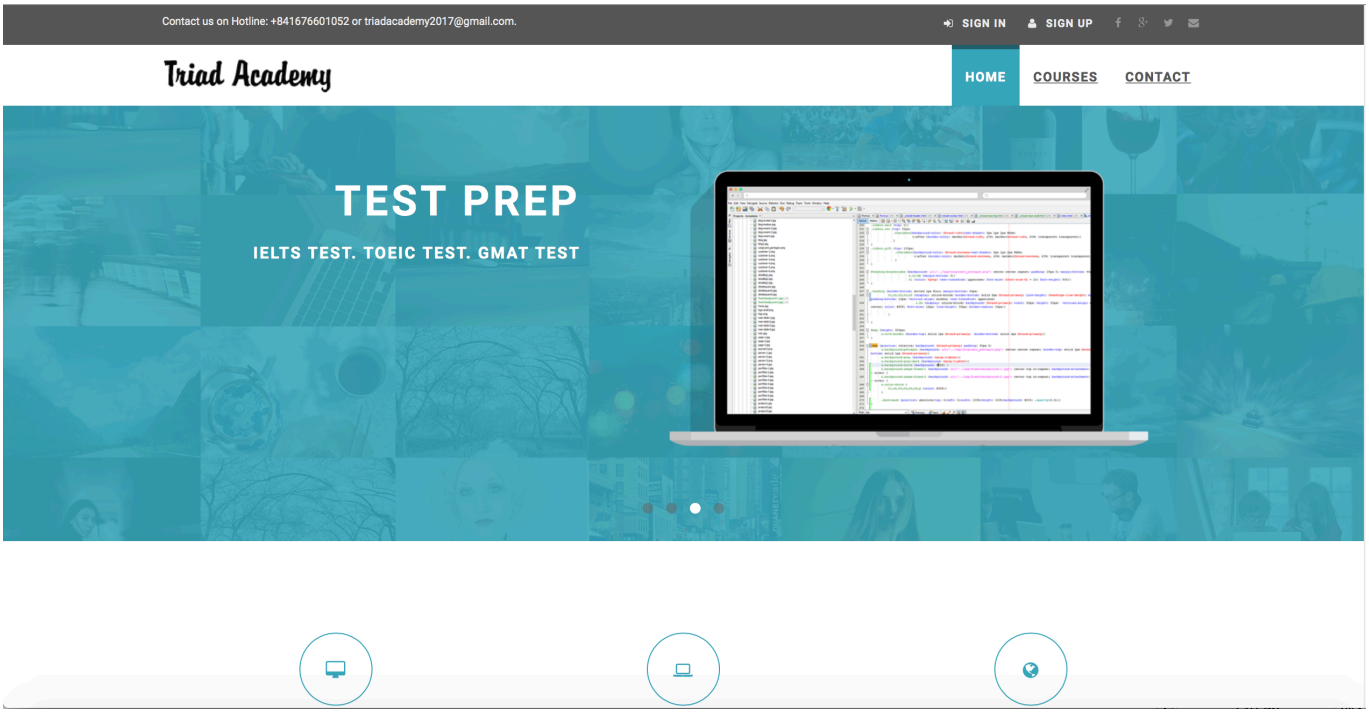
COURSE ACTIVITY MANAGEMENT FOR DISTANCE LEARNING

28.10.2017

COURSE: SOFTWARE ENGINEERING
FALL 2017

CLASS: TUESDAY MORNING (THEORY)
STATURDAY AFTERNOON (LABORATORY)

INSTRUCTOR: MS. NGUYEN THI THANH SANG



MEMBER CONTRIBUTION

Name	ID	Contribution
Huynh Le Ngoc Han	ITITIU14027	I. Overview II. Goals & scope V. Schedule VIII. Sercurity Aspects
Le Truong Trong Nguyen	ITITIU14066	III. Organization IV. Resource Requirements VII. Delivery Plan
Ly Thu Thao	ITITUN15008	VI. Risk Management IX. Abbreviations & Definitions X. References

OUTLINE

I. OVERVIEW

1. About Us

TRIAD is a company specializing in developing software and web application. We focus on creating the products with high quality in design, functionality, and performance. Our customers range from small to medium enterprises, development partners.

Company Name:	TRIAD
Team Name:	TRIAD
Business:	- Develop software - Develop and design web application
Customer:	Ms. Nguyen Thi Thanh Sang
Office:	International University, Quarter 6, Linh Trung Ward, Thu Duc District, HCM City
Email:	triad@gmail.com
Phone:	(+84) 976 900 173 (Ngoc Han)

2. Product's Information

Technology is changing the way teacher teaches and learner learns. Difficulty in obtaining higher education increases for thousands of reasons. It could be their possible limit of capabilities with an educational environment or disabilities that limit their access to educational institutions. There are also a number of people that live a great distance from the educational institutions. The need to commute becomes an encumbrance to achieving higher education. Also, the job markets are so competitive that employees find that they must obtain higher education for further employment success. With synchronous schedules in present educational institutions, individuals are required to resign from their current employment to further their education. Typically, individuals are not willing to surrender their income due to the need to support a family or their current lifestyle. Some form of educational reform must take place to address the problems.

Our Distance Learning website is the solution to the above problems. The greatest appeal of distance learning is that one can study without having to leave home or a job to obtain higher education. This website made it possible for students to complete their education without having to sacrifice their career and family time.

This product is a part of the project for a one-semester University course. Due to the constraints in time (around 2 months) and human resources (3-5 members), it is impossible for us to deliver a complete product with all great functionalities as we want to. Therefore, we only aim at implementing some basic services of a distance learning website, and leave some of them for the future development. Our criteria are: Clear, Simple, but Attractive.

Aside from the costs for hardware resources and domain server used to develop and run the system, which our team decides to take care of by ourselves, we intend to distribute the final product absolute free for everyone. Any donations from the community are strongly appreciated, but are not required.

Our early approximation:

Time Delivery	**The First Day** of the Construction: **20th October, 2017**. **The Last Day** of the Construction: **18th December, 2017**. **Duration**: approx. **2 months**. Demonstration: [date to demonstrate the project to the class]
Budget	To implement this project, our team is going to need an amount of budget . This amount is separated into three kinds : hardware budget , software budget , human budget. - Hardware budget : $3500 - Software budget : $3900 - Human budget: $5000 - Additional budget : $1000 - **Total cost estimated** : $13400 The detail cost will be present in section Resource Requirement

II. GOALS & SCOPES

Priority: 1- Highest 5- Lowest

2.1. Project Goals

PROJECT GOALS	PRIORITY	DESCRIPTION
FUNCTIONAL GOALS		
1. Requirement Specification	**2**	All documents should be clear, easy to understand and collected from all stakeholder.
2. UI Design	**1**	The User Interface of final system should be simple, well-organized, convenience.
3. Implementation	**2**	All functions must be clear, maintainable and flexible.
4. Testing	**3**	Testing phase should be included testing plan and testing the whole system with test cases, make sure paying attention into the result of process.
STRATEGIC GOALS		
1. Customer services	**1**	System shall be able to achieve and maintain outstanding services for users.
2. Popularity	**1**	System shall attract many users and make a well- known status in the Internet community.
BUSINESS GOALS		
1. Released time	**2**	The final product shall be delivered within 2 months from first day of the development process.
2. Cost	**2**	The final system (Distance Learning Course Management) shall be delivered to users with the appropriate price. Additionally, we also charge for advertisements from other organizations and use that profit to cover the cost of running the system.
3. Market growth	**3**	The final product shall produce significant growth in the market.
TECHNOLOGICAL GOALS		
1. Basic functions	**1**	System shall deliver standard functions for distance learning course management.

2. Future enhancement	**2**	System shall leave rooms for future improvement (can implement new functions).
QUALITY GOALS		
1. Functions execution	**1**	System shall be able to execute all the implemented functions smoothly, free of errors.
2. Response time	**2**	System shall be able to respond to user within an acceptable amount of time.
3. System interface	**1**	System shall display its components in an organized and well-formatted way; clearly and easy to use.
ORGANIZATIONAL GOALS		
1.Competence development	**2**	System shall be designed and implemented so that it is able to compete with the top product in the market.
2. Maintenance	**3**	System shall be developed such that it is easy to be maintained.
3. New technologies	**4**	System shall be able to adapt to new technologies.
4. Modern tools exploitation	**4**	Up-to-date tools and technologies shall be used to develop the whole system.
CONSTRAINTS		
1. Environment constraints	**3**	System shall be able to access by multi-platform devices.
2. Application standards	**1**	System shall satisfy most common standard rules of a web application.
3. National and cultural standards	**3**	System shall not be illegal.

2.2. Project Scope

Customer classifications:

1. Unprivileged user: Guests
2. Privileged users:
   - Instructors/Lecturers
   - Students

2.2.1. Included

Due to time and human constrains, our final project can only provide some standard functions that is typical for the Course Activity Management for Distance Learning:

- Register function (Register account, register course).
- Authentication function (Login/Logout function).
- Announcement Management function.
- Allow instructor to create subject matters such as course syllabus, new discussion topic and special topic.
- Allow instructor to set the time range (deadline) for each of topic he/she post.
- Allow instructor, student to upload/download the file (paper exam, course material).
- Allow student to post comments/messages.
- Allow instructor, student to edit their profile.
- Allow instructor, student to search for course.

2.2.2. Excluded

There are some functions our group decided to exclude from the project but may intrigue customers will be left for future improvements, including:

- Allow instructor, student to delete their post or comments.
- Allow instructor, student to edit their post.
- Allow instructor, student to choose among different sorting options for displaying their post in topic discussion.

III. ORGANIZATION

3.1. Organizational Boundaries and Interfaces:

The project is intended to be implemented on a web-based platform, which provides access to anyone who has Internet connection. Due to the fact that this is just an own-funding project developed during a university course, all the stakeholders of the system are members of the team. There are currently no external stakeholders that the project depends on.

The main resource owners of the project are all team members, who take full responsibilities in the process of developing and delivery of the system. Our expected receiver of the final product is the Internet community. Any Internet users who take an interest in the project can use it absolute free, but only for the purpose of discussion and sharing ideas with no specific commercial intentions.

List of suppliers for our project:

Company	Deliverable Product
Microsoft Corporation	Microsoft Office 365
Oracle Corporation	MySQL Database
Sun Microsystems / Oracle Corporation	TomCat Server
Sun Microsystems / Oracle Corporation	NetBeans IDE

3.2. Project organization:

Our project development process is organized in such a way that all members have a fair share of work, and all actively take part in the successful delivery of the system. Some members are assigned specific roles due to their outstanding performance in these functions, which will likely enhance the quality of the final product further. Here is a list of our team members, their roles and their contacts:

Name	Role	Contact	Email
Huynh Le Ngoc Han	Project Manager / Programmer	+84 976 900 173	Hlngochan.ityu@gmail.com
Le Truong Trong Nguyen	Programmer / Designer	+84 1676 601 052	lttnguyen.ityu@gmail.com
Ly Thu Thao	Business Analyst / Tester	+84 1638 612 197	ltthao.ityu@gmail.com

IV. RESOURCE REQUIREMENTS

4.1. Hardware resource

Name	Purpose	Quantity	Price	Total estimation
Macbook Pro Retina 13 inch 2015	Coding/Testing	2	$1227	$2454
HP Envy 13 inch 2016	Coding/Testing	1	$1000	$1000
Total estimation for hardware resources:				**$3454**

4.2. Software resource

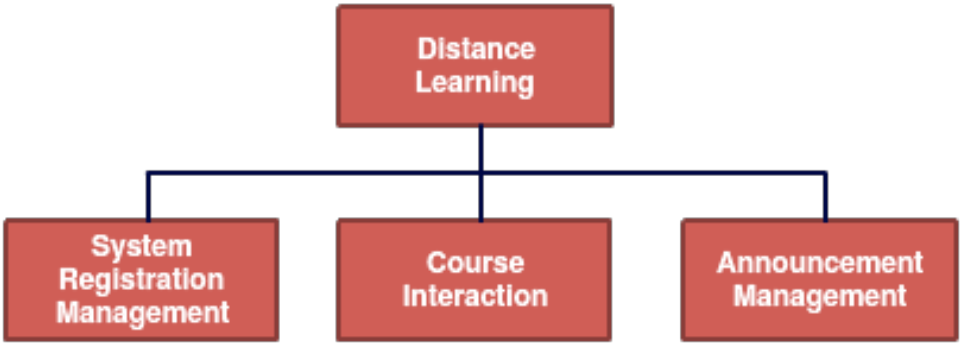
Name	Purpose	Quantity	Price	Total estimation
Microsoft office 365	Project management and documenting	3	$900	$2700
NetBeans IDE	Developing	3	Free	$0
Adobe Photoshop	Designing	1	$600	$600
Lucid Chart	Mind- map/ Diagram	3	$200	$600
Total estimation for software resources:				**$3900**

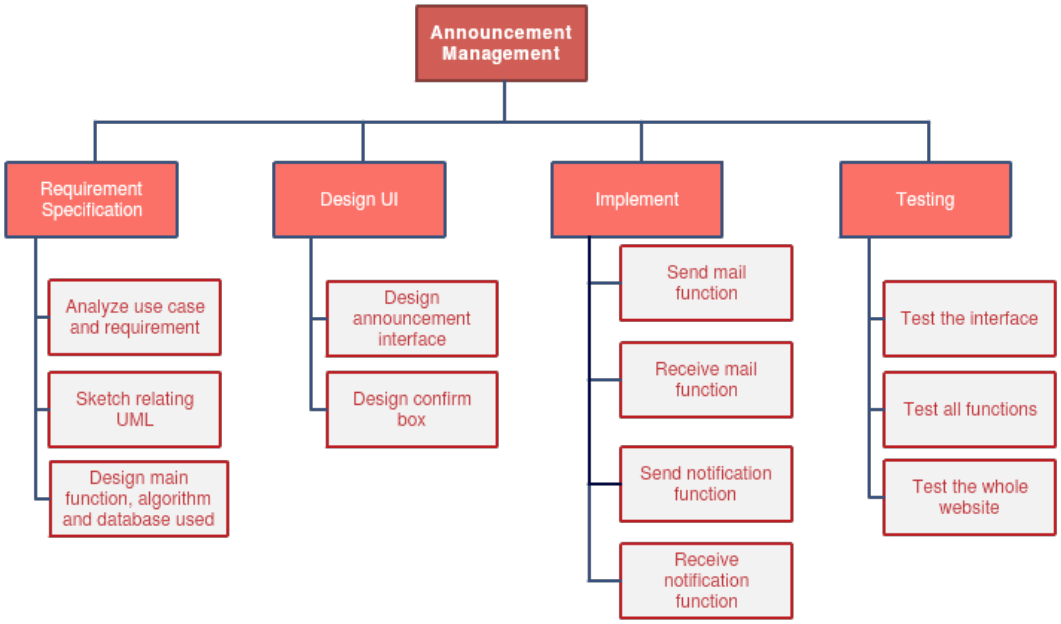
4.3. Human resource

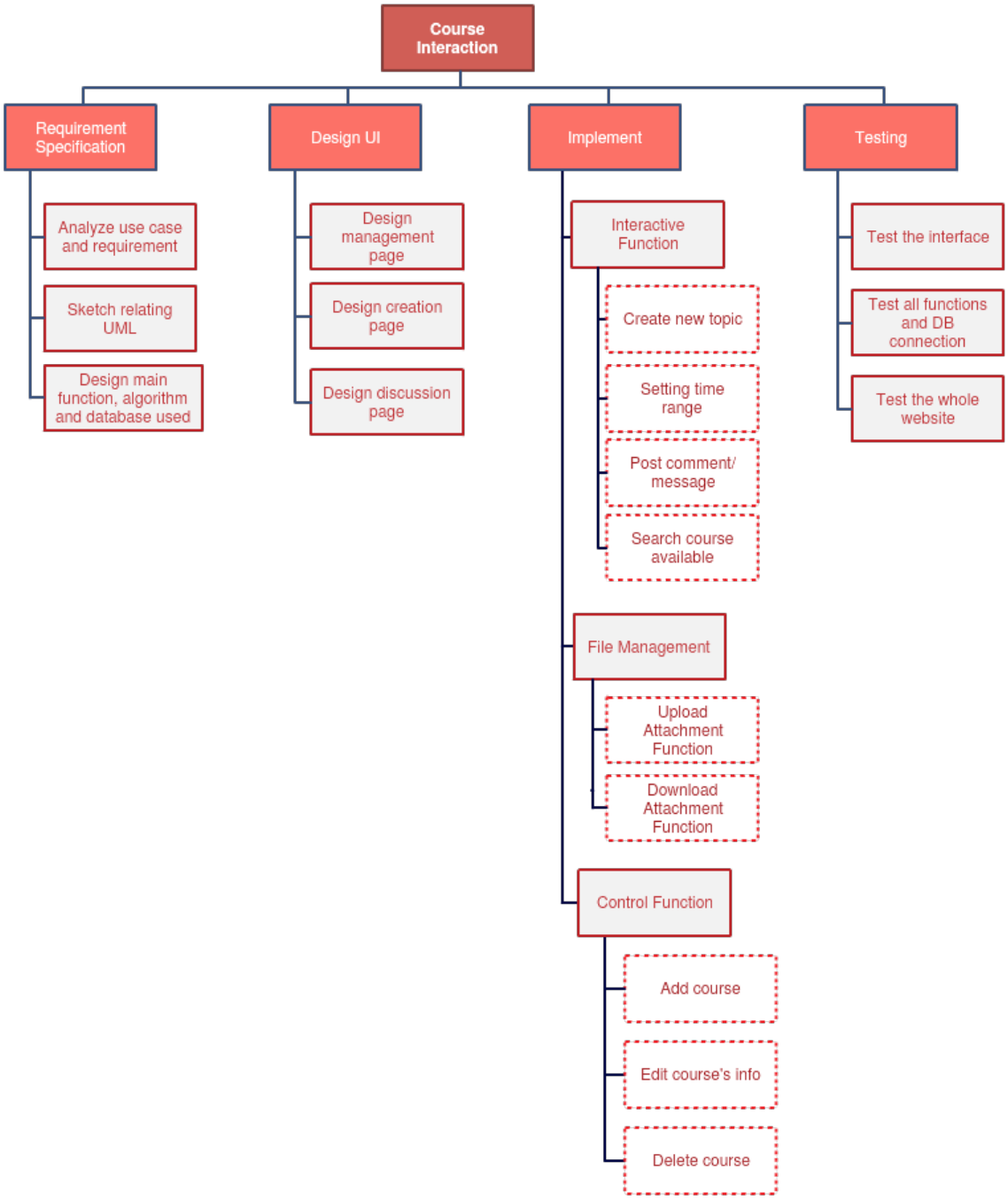
Name	Skillset	Time	Salary (per month)
Huynh Le Ngoc Han	Programmer, Project manager	Full-time	$900
Le Truong Trong Nguyen	Programmer, Designer	Full-time	$800
Ly Thu Thao	Business analyst, Tester	Full-time	$800
Total estimation for human resources:			**$2500**

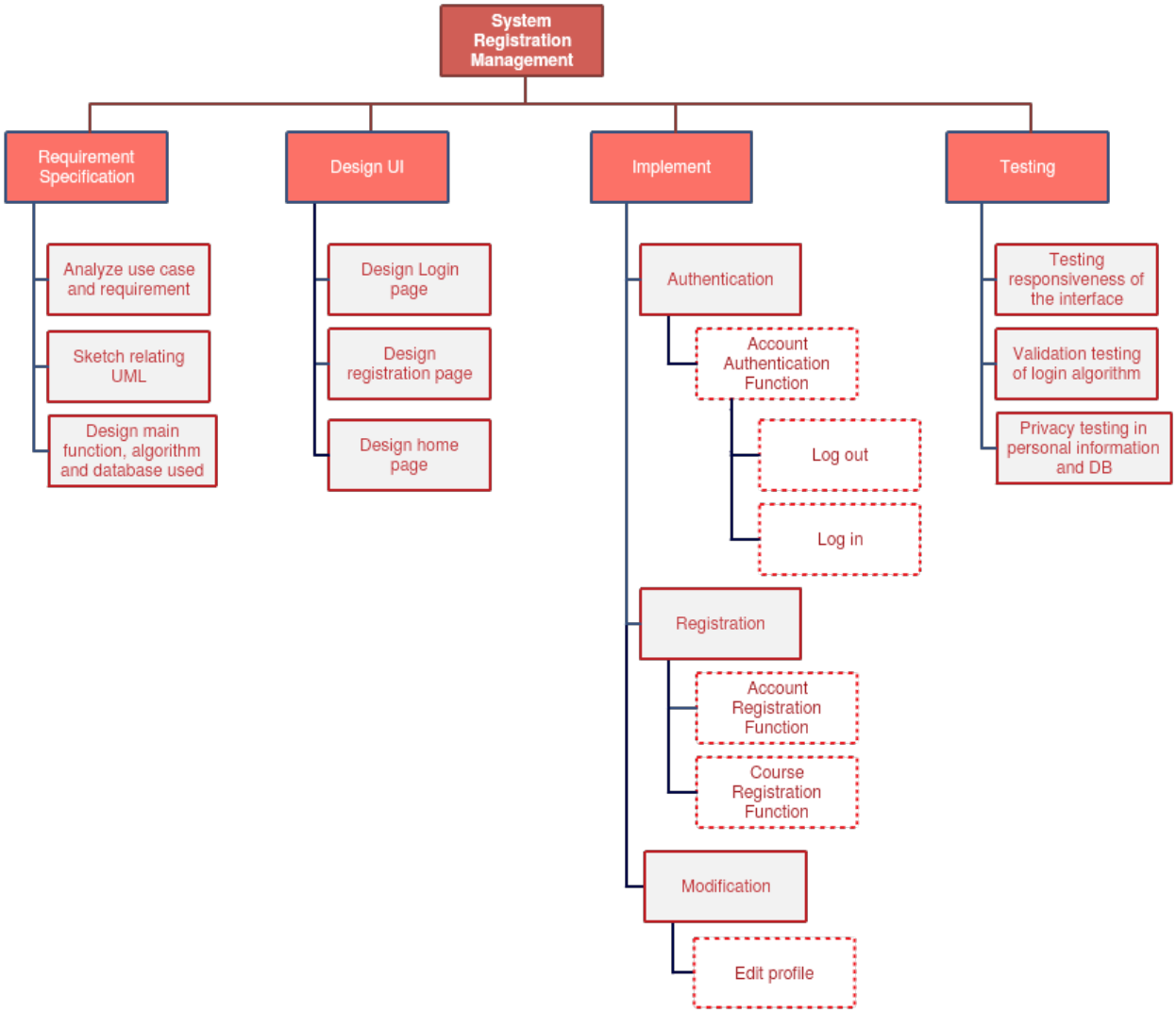
V. SCHEDULE

5.1. Work Breakdown Structure






Course Interaction
Requirement Specification
Analyze use case and requirement
Sketch relating UML
Design main function, algorithm and database used
Design UI
Design management page
Design creation page
Design discussion page
Implement
Interactive Function
Create new topic
Setting time range
Post comment/ message
Search course available
File Management
Upload Attachment Function
Download Attachment Function
Control Function
Add course
Edit course's info
Delete course
Testing
Test the interface
Test all functions and DB connection
Test the whole website


System Registration Management
Requirement Specification
Design UI
Implement
Testing
Analyze use case and requirement
Sketch relating UML
Design main function, algorithm and database used
Design Login page
Design registration page
Design home page
Authentication
Account Authentication Function
Log out
Log in
Registration
Account Registration Function
Course Registration Function
Modification
Edit profile
Testing responsiveness of the interface
Validation testing of login algorithm
Privacy testing in personal information and DB

5.2. Schedule and Milestones

Here is the **product backlog** that our team comes up with after applying Scrum Framework to the project development process:

Priority: 1- Highest 5- Lowest

Sprint	ID	Backlog Items	Estimate (days)	Priority
Sprint 1 20.10.2017 - 27.10.2017	1	As a guest, I want to register an account so that I can have all member's accessibilities.	2	1
	2	As a user (instructor/student), I want to login/logout my account.	3	1
Sprint 2 28.10.2017 - 03.11.2017	3	As a user (instructor/student), I want to search for available courses.	3	2
Sprint 3 04.11.2017 - 10.11.2017	4	As a student, I want to register a course	3	1
Sprint 4 11.11.2017 - 17.11.2017	5	As an instructor, I want to post a thread (including setting deadline and contents).	4	1
Sprint 5 18.11.2017 - 24.11.2017	6	As an instructor/student, I want to upload/download (documents, images, etc.)	2	4
Sprint 6 25.11.2017 - 01.12.2017	7	As a student, I want to post comments/messages to contribute to topic.	4	1
Sprint 7 02.12.2017 - 08.12.2017	8	As an instructor, I want to send announcements to all students.	5	3

Sprint 8 09.12.2017 - 15.12.2017	9	As a user (instructor/student), I want to edit my profile.	4	4

Schedule and Milestones

Whole team	
Designer	
Programmer	
Tester	

Sprint 1 (20.10.2017 – 27.10.2017): Register account + Login/logout							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for registration page							
Design interface for login page							
Coding “Register account” function							
Coding “Login/logout” function.							
Design + insert data into database							
Test functions with database							

Sprint 2 (28.10.2017 – 03.11.2017): Search course							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for registration course page							

Design interface for search course page							
Coding “Register course” function							
Coding “Search course” function.							
Design + insert data into database							
Test functions with database							

Sprint 3 (04.11.2017 – 10.11.2017): Register Course							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for thread page							
Coding “Create thread” function							
Design + insert data into database							
Test functions with database							

Sprint 4 (11.11.2017 – 17.11.2017): Create Thread							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for registration course page							
Design interface for file management page							
Coding “Upload file” function							
Coding “Download file” function.							

Insert data into database							
Test functions with database.							

Sprint 5 (18.11.2017 – 24.11.2017): Upload/Download file							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for comments page							
Coding "Post comments" function							
Insert data into database							
Test functions with database.							

Sprint 6 (25.11.2017 – 01.12.2017): Post comments/message							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for announcements page							
Coding "Send & receive announcements" function							
Insert data into database							
Test functions with database.							

Sprint 7 (02.12.2017 – 08.12.2017): Set announcements							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							

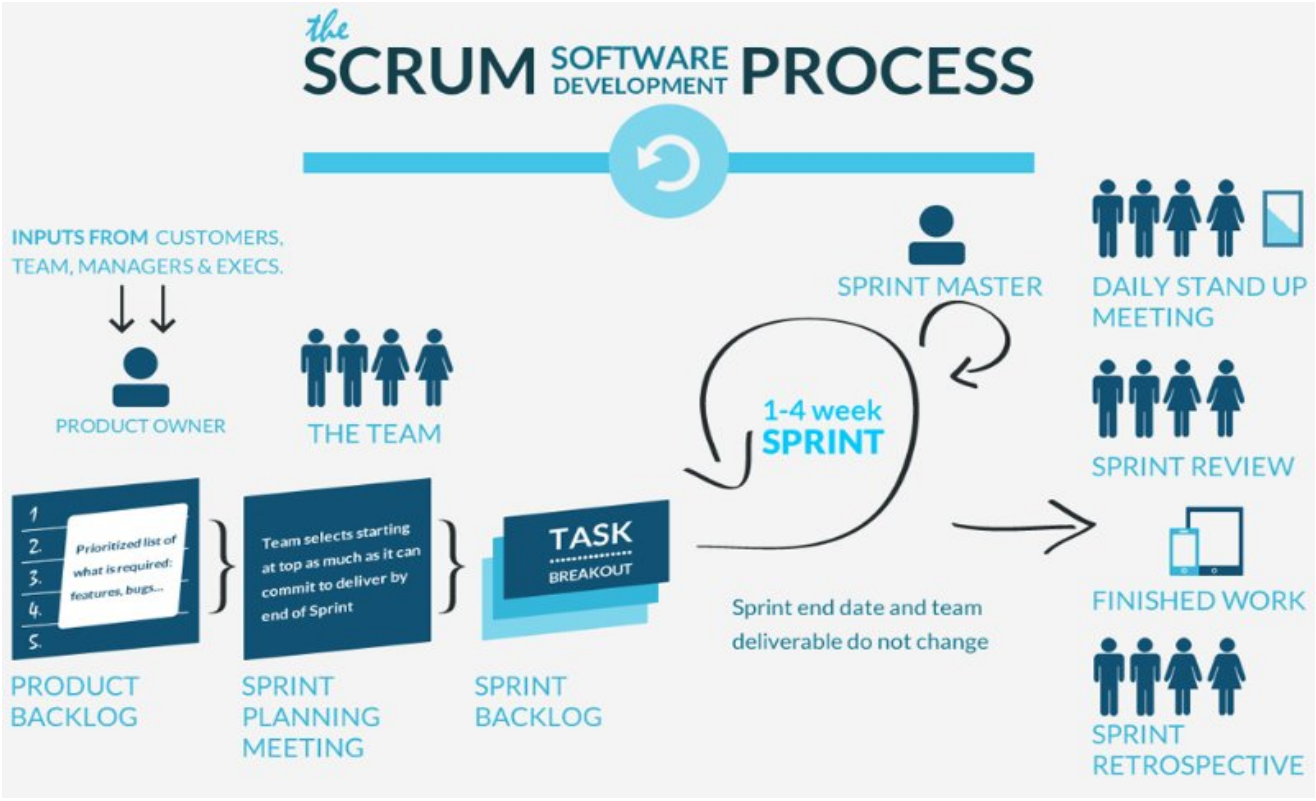
Design interface for course managements page for administrator							
Coding “Add course” function							
Coding “Edit course” function.							
Coding “Delete course” function.							
Insert data into database							
Test functions with database.							

Sprint 8 (09.12.2017 – 15.12.2017): Edit profile							
Tasks	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
Analyze the requirements and define the concept of the functions							
Design interface for personal information page							
Coding “Edit profile” function							
Insert data into database							
Test functions with database.							

5.3. Development Process (optional)

In order to deliver the product on time, our team has chosen to adopt an agile method of development for our project. Specifically, Scrum will be the main methodology we used for our team’s general productivity model.

Our requirement details are expected to change across the design and development period as the project depends on developing each functional part separately then integrating them holistically.


the
SCRUM SOFTWARE DEVELOPMENT PROCESS
INPUTS FROM CUSTOMERS, TEAM, MANAGERS & EXECS.
PRODUCT OWNER
THE TEAM
SPRINT MASTER
DAILY STAND UP MEETING
1-4 week SPRINT
SPRINT REVIEW
1
2.
3.
4.
5.
Prioritized list of what is required: features, bugs...
Team selects starting at top as much as it can commit to deliver by end of Sprint
TASK
BREAKOUT
Sprint end date and team deliverable do not change
FINISHED WORK
PRODUCT BACKLOG
SPRINT PLANNING MEETING
SPRINT BACKLOG
SPRINT RETROSPECTIVE

5.4. Development Environment (optional)

Some programming languages as well as framework and IDEs that our team use to develop the project:

-HTML - to develop the outline and structure of the webpage

-CSS - to decorate the webpage

-Javascript / HTML5 - to create animations and functional scripts

-Servlet / JSP - to manipulate data to create dynamic web pages

-MySQL - to store and manage data through a database

The team also uses some external web applications to help organize ideas, share codes and documents, and measure the performance of the team as a whole:

-Messenger – a messaging app for teams

-Github – a web-based Git repository hosting service

-Lucidchart – a web-based application for drawing many kinds of software diagrams

-Gmail - communication tool

-Google Doc & Drive - sharing data tool

5.5. Measurement Program (optional)

For our project system, a Distance Learning, speed performance is the top priority that we intend to maintain. Therefore; beside implementing handmade testing units, our team also tries to use as many as possible some external on-line program to measure the system's correctness and performance. Some of them are:

https://developers.google.com/speed/pagespeed/

SonarQube: http://www.sonarqube.org/

VI. RISK MANAGEMENTS

This section describes some potential risks that our project is likely to suffer during the development process and / or after releasing, along with some solutions to mitigate and avoid the hazardous effects these risks can have on the final product. Three classifications of risk:

Project risks	Affect schedules and resources.
Product risks	Affect the quality of performance of the software being developed.
Business risks	Affect the organization developing or procuring the software.

***Degree of effects:**

Catastrophic	
Serious	
Tolerable	
Insignificant	

PROJECT RISKS			
Risk	**Probability**	**Description**	**Strategy**
Staff turnover	High	Members leave the project before it's finished without reasons; members are absented from team meetings.	Have daily meeting after work to discuss difficulties with teammates and find suitable solution
Requirements changes	High	Changing requirements from customers directly affect the project schedule.	Adjust the schedule and the amount of work accordingly as the customer demand.

Hardware defections	Moderate	Some unexpected hardware problems occur during the development process, which forces the team to find replacements.	Perform weekly maintenance and prepare backup resources for all hardware components.
PRODUCT RISKS:			
Unexpected bugs	High	UI bugs, spam, advertisements, fonts missing, and many other problems that annoy users but have not been detected before.	Regularly update functions and refractor codes; use up-to- date tools.
Server bandwidth underestimate	Moderate	Server breakdown due to overloading access from many users trying to enter the forum.	Purchase high bandwidth server and upgrade monthly.
Member under-performance	Moderate	Individual performances are not as expected due to the lack of skill and experience on the project topic.	Project leader has to balance the number of junior and senior developers in the team to help overcome lacks of experience.
BUSINESS RISKS:			
Product competition	Low	There are similar products (with the same type or idea) that have been released in the market.	Discuss with customers to add some specific features that help improve the quality of the product.
Budget underestimate	High	Wrong budget estimation; cost overruns due to unexpected expansion of project scope.	Carefully estimate the project scope to avoid unnecessary expansions.

Late delivery	Moderate	Additional cost may have to be paid to compensate for the late delivery of the final product to the customer.	Project leader has to ensure that each sub-component of the system and the final product itself are finished before the expected deadlines.

VII. DELIVERY PLAN

Sprint	Main Tasks	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Estimated Total Hours
Sprint 1 (20/10) - (27/10)	**User story:** *As a guest, I want to register an account so that I can have all member's accessibilities.* **User story:** *As a user (administrator/instructor/student), I want to login/logout my account.*								
	Design UI for entering user information.	4	2						48
	Design UI for getting account information		4	2					
	Design use cases and class diagrams			4					
	Create database to manage data of users	3							
	Code function for adding account information	3	2						
	Code function for checking account		3	3					

	information								
	Test functions and database				6	4			
	Get user feedbacks			4	4				
Sprint 2 (28/10) – (3/11)	**User story:** *As a user (administrator/instructor/student), I want to search for available courses.*								
	Design UI for Main Home Page.	3	4						51
	Design UI for choosing courses		2	5					
	Design use cases and class diagrams.	4							
	Create database to store available course	4	6						
	Coding function for search available course		2	3	3				
	Test functions and database					4	2		

	Get user feedbacks						4	4	
Sprint 3 (4/11) – (10/11)	**User story:** *As a student, I want to register a course*								
	Design UI for Main Course page.	3	4						33
	Design use cases and class diagrams.		5	2					
	Coding function for register course	2	3	4	2				
	Test functions and database			4	2	2			
Sprint 4 (11/11) – (17/11)	***User story:*** *As an instructor, I want to post some thread (including setting deadline and contents).*								
	Design UI for entering course syllabus.	5	2						45
	Design UI for Content box which include discussion topic, course syllabus and so on.		5	2					

	Design use cases and class diagrams	3		2					
	Design database to store data of posts.				2	3			
	Code function for creating new topic		4	3					
	Code function for count range time			2	2				
	Test functions and database				4	3			
	Get user feedbacks					3			
Sprint 5 (18/11) – (24/11)	**User story:** *As an instructor/student, I want to upload /download/ files (documents, images, etc.)*								
	Design UI for reviewing file	2	3	2					49
	Design use cases and class diagrams	2	2	3					
	Design database to store		3	2					

	data files.								
	Code function for downloading file.	4	3						
	Code function for uploading file.	4	3						
	Test functions and database			3	3				
	Get user feedbacks				4				
Sprint 6 (25/11) – (1/12)	**User story:** *As a student, I want to post comments/messages to contribute to topic.*								
	Design UI for posting messages.	2	4						35
	Design use cases and class diagrams		2	2					
	Design configure database for comments..			3	2				
	Code function for posting comments.	4	2						

	Test functions and database		2	3					
	Integration Testing			2	3				
	Get user feedbacks					4			
Sprint 7 (2/12) – (8/12)	***User story:*** *As an instructor/administrator, I want to send an announcement to all students.*								
	Design UI for Announcement Home Page	5	4						52
	Design use cases and class diagrams	4	2	1					
	Design database for storing announcement 's content		3	3	1				
	Code function for send announcement for student	4	4	4					
	Test functions and database			4	2				

	Get user feedbacks				4				
Sprint 8 (9/12) – (15/12)	**User story:** *As a user (administrator/instructor/student), I want to edit my profile*								
	Design UI for Personal Profile Page.		4	3					28
	Code function for edit users profile		3	4					
	Test function and database			4	1				
	Integration Testing				3	2			
	Get user feedbacks					4			

VIII. SERCURITY ASPECTS (OPTIONAL)

No matter how well-prepared your product was made, there will always be some potential loopholes that can be exploited to shut down or corrupt the whole system. In this section, we list some of the possible security issues that we expect to happen as well as our strategy to deal with these problems.

Some negative effects that may happen due to security incident attacks:

-Information and identification leaking which threatens users' privacies.

-Unable to connect to system due to intentional internet traffic breakdown.

-Loss of reputation and beliefs from community.

-Data loss result in student's complaint and dismiss course.

-Course and student/teacher's info is modified unexpectedly.

Here are some vulnerabilities that are likely to happen to a web-based project system.

Vulnerability	Description	Solution
SQL Injection	SQL injection is a code injection technique that might destroy your database. This is one of the most common web hacking techniques which is the placement of malicious code in SQL statements, via web page input. SQL injection usually occurs when you ask a user for input, like their username/userid, and instead of a name/id, the user gives you an SQL statement that you will unknowingly run on your database.	Wrap all the SQL queries with prepared statements, along with parameters. - Add info so that the tables in database is not easily exposed to the outside of the webpage - Escape user input before putting it in a query - Data submitted by form should always be set to 'POST' method.
Hacker	Hackers can hack into the website to take information out of it, or even modify the info on the web and hack it down for evil purpose.	Tighten security and check the system weekly to prevent any information leaked.

Broken Authentication	Some sensitive functions like authentication are often built up without proper handling methods, thus allows the possibility that these critical information being illegally obtained by malicious user.	Use a generic way to display notification message to user, avoiding unexpectedly expose user's information. Use proper encryption technique and implement necessary constraints to secure sensitive information.

IX. ABBREVIATIONS AND DEFINITIONS

WORD	MEANING
UI Design	User Interface Design
MySQL	A freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL)
Hardware	Physical component of a computer system
Software	The programs and other operating information used by a computer.
Usecase	A use case is a methodology used in system analysis to identify, clarify and organize system requirement
Product backlogs	A list of all things that needs to be done within the project
Agile	A group of software development methods
Scrum	A lightweight process framework for agile development
Iteration	The process of repeating computing process
HTML	Hyper Text Markup Language - the standard markup language for creating Web pages.
CSS	The language for describing the presentation of Web pages, including colors, layout, and fonts

Bug	An error, flaw, failure or fault in a computer program or system that causes it to produce an incorrect or unexpected result

X. REFERENCES

https://en.wikipedia.org/wiki/Distance_education

https://creately.com/diagram/j9a2557r2