# *Systems III (420-E31-HR)*

# *Assignment 4 – Final Comprehensive Assignment*

Date assigned: Wed, November 22, 2017

Date due: **Wed, December 6, 2017**

**Learning Objectives**

Upon successful completion of this assignment, the student will be able to:

* Describe traditional and Agile estimation options for a project
* Identify the tasks required to complete a project
* Create a project plan using MS Project
* Identify and mitigate risks associated with a project
* Identify testing requirements
* Perform a security analysis of a system
* Choose a conversion strategy for the installation of a system

To do:

This assignment is based on the Alumni System. The description of the features of this system, which was developed as a third year project, is as follows:

* 1. The system provides a searchable online directory, consisting of a list of existing alumni which may be filtered according to certain criteria, e.g. name, graduation year.
  2. The alumnus profiles contain a minimum level of personal information, including name and graduation year, as well as a number of additional fields which may be completed at the user’s discretion. Alumnus users are also able to upload and display a photo to identify their profile if they so desire.
  3. Alumni who register are given the option of identifying themselves as willing volunteers. This is displayed for others, especially program coordinators, to see and make use of. This way, Program Coordinators are able to contact only Alumni who show interest in helping.
  4. The system displays College news and events. This feature provides users with a way to stay connected with the College’s events. This feature can also be used by the different programs, to advertise their program specific news and events.
  5. Different users have different roles and access. Basic users have access to simple functions. Administrators are able to send mass e-mails to alumni of an entire program. System Managers are able to admit, remove and update Alumni information and other system functions. They can additionally grant rights to other users.
  6. Alumni have the ability to send private messages to other alumni from within the system.
  7. The system administrator can view all the activity in the system, including who has logged in, registered, and changed their profile.

The following is a list of the rules in the Alumni System:

* 1. A person must be an alumnus to register.
  2. The alumnus must provide a name, student id and year that match the data on file.
  3. The alumnus must follow the instructions in the validation email prior to the first logon.
  4. When using the alternate registration method, the alumni must provide the year they graduated, the program they graduated from, their mother’s maiden name, and birth date which match the data on file.
  5. Alumni can only log in after they have validated their email address.
  6. Alumni can only register with one email address.
  7. The password must be at least 8 characters long.
  8. The registration email must have a valid format.

1. Create a new document named **YourUserName\_E31\_A04\_Final.docx** in your 420-E31 folderin your home drive. Add a title page to the document, with the course name, assignment name (Final Comprehensive Assignment), your name, the semester, and the date. For each of the questions in the assignment, create a section heading with an appropriate title in the document.
2. Estimation – summarize four estimation techniques that could be used to estimate the effort of this project and explain which one you think should be used.
3. Project Plan – Develop a project plan for the development of the application using a waterfall approach.
   1. Assume that there will be five sprints, each lasting two weeks.
   2. Assume the project starts on January 9, 2017.
   3. Include the study week and Easter holidays as non-working time.
   4. Assume that you have five people to work on the project. One of those five people is only available 50% of each work week. A second person is on vacation for the month of February.
   5. Assign the five people to the tasks in a logical way.
   6. Include the relevant testing activities required.
   7. Include any other required transition activities.
   8. Include appropriate milestones.
   9. Make sure your plan is levelled and dependencies are correct.
   10. Baseline your plan.
   11. Copy the Gantt chart to this document and save the plan as **YourUserName\_E31\_A04\_Final.mpp.**
   12. Which resource is on the critical path of your project?
4. Risk Management - You are going to develop the Alumni system using Python. The development team was supposed to have seven programmers and testers, but you have only been able to staff five of those positions. There are currently about six weeks of slack time in your project plan. Identify three risks that you should consider for this project, and propose how you will mitigate the risks.
5. Velocity - Your team of five people is going to use velocity to help plan the contents of the sprints.
   1. What is velocity?
   2. What will you do for your first sprint to determine the velocity?
   3. Another team of five developers are several sprints into their project, and their manager has recommended to your manager that you use their velocity for planning purposes. How would you react to this suggestion?
6. Standards - Before you start development of the project, your team needs to decide on the user interface and coding standards that will be used.
   1. Why is it important to develop standards for a project?
   2. List five things in your code that you should standardize.
   3. List five things in your user interface that you should standardize.
7. Security - We have investigated many security issues in this course such as: user authentication and authorization, encryption, confidentiality and privacy of data, database security, protection against path truncation and reverse directory transversal, protection against cross-site scripting and SQL injection attacks, and input validation.

Describe the main security issues that need consideration in the development of the Alumni system. For each area listed above, describe whether it is a consideration or not, and why. Describe how to design the system to handle the issues. State any assumptions that you make.

1. Defects - Before your team begins testing the Alumni System, they need to know how to write a proper bug report.
   1. In **one** paragraph, describe the main things that need to be included in a proper bug report.
   2. If a problem is found during testing of the Alumni System where the system crashes when a new user attempts to register, what severity and priority should be assigned to this defect?
   3. If a problem is found during testing of the Alumni System where the College news is partially cutoff on the screen if Internet Explorer is used, what severity and priority should be assigned to this defect?
2. Exploratory testing – Write a paragraph describing whether you think exploratory testing should be performed on the Alumni System. Describe what exploratory testing is and whether it is appropriate in an Agile environment.
3. Black Box testing - Refer to the “Search Alumni Directory” use case narrative, which is posted on Moodle as an appendix to this assignment. Develop a test case matrix, with the test case ID, condition, data elements and expected result. Complete the table, using V for valid data, I for invalid data, and N/A where the data element is not applicable for the condition. (You do not need to do the second table with test data in it.)
4. System Testing - Write ten different system test cases to test the Alumni System. Each test can be written in a few sentences. Make sure that it is clear which roles are involved and what functionality is being tested
5. White box testing – Write one paragraph describing the types of static white box testing methods that you think should be done on the Alumni system. Write a second paragraph describing the types of dynamic white box testing methods that you think should be done on the system. Compare Statement coverage versus Path coverage and explain how it is possible to achieve 100% Statement coverage but not 100% Path coverage.
6. Identify the installation conversion strategy (style, location and module) that would be most appropriate when installing the Alumni system for the first time and explain why.
7. Add a table of contents to the document.

**To submit**

When you have completed the assignment, submit the following files to the Moodle page for this course:

* **YourUserName\_E31\_A04\_Final.docx**
* **YourUserName\_E31\_A04\_Final.mpp**

**Marking Scheme**

|  |  |
| --- | --- |
|  | **Out Of** |
| Alumni System Document |  |
| Cover page & table of contents | 2 |
| Estimation | 5 |
| Project plan | 15 |
| Risk management | 6 |
| Velocity | 4 |
| Standards | 6 |
| Security analysis | 16 |
| Defect management | 7 |
| Exploratory testing | 4 |
| Black box testing | 10 |
| System testing | 10 |
| White box testing | 6 |
| Installation conversion strategy | 4 |
| Proper use of English | 4 |
| Assignment Organization | 1 |
| **Total** | 100 |