
Test Plan

InPress – Group 3

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Table of Contents

List of Tables	2
Change History	3
Test Factors and Rationale	4
Testing Method	5
Types of Tests:.....	5
Structural Testing	5
Functional Testing	5
Unit Testing.....	6
Static vs. Dynamic Tests.....	6
Manual vs. Automated tests:.....	6
Test Cases:	6
Summary	10
Testing Schedule (Tentative).....	10

List of Tables

Table 1: Change History	3
Table 2: Test Factor and Rationale.....	4
Table 3: Test Cases	10
Table 4: Testing Schedule	11

Change History

The following table shows the change history for this test plan document.

Version	Date	Author	Comments
—	—	AHM, LW, JK	Original content.
0	Oct 30/2013	AHM, LW, JK	Initial check in
1	Feb 24/2014	AHM, LW, JK	Revision 0
2	Mar 18/2014	AHM, LW, JK	Test Plan Updates – Test cases, Test plan for Automation
3	April 15, 14	AHM, LW, JK	Performance changes, Functional Testing, Manual vs. Automation

Table 1: Change History

Test Factors and Rationale

Test Factor	Rationale
Reliability	Reliability in this software is critical to its success. The software must be robust (able to recover from errors), maintainable (able to apply fix packs easily), and must be available during School Hours.
Authorization	This software must be compliant to the standard security protocols (such as prevention for SQL Injection and HTTPS) to be used in Universities/Colleges. It should only allow users with the correct credentials to log in and manage their account. Furthermore, only system administrators should be able to create instructor accounts.
File/Data Integrity	All data in the internal database should not be altered or destroyed in an unauthorized manner, and thus it should be prevented from being corrupted either accidentally or maliciously. All read/write operations on the database should also be accurate 100% of the time. Data integrity is critical because users of this software expect that data they provide is stored in a “correct” fashion, and outputted data is not corrupted.
Access Control	There are three types of users in this system - System administrators, instructors, and students. Instructors will only have full-control over courses in which they have created. Other courses in the system will be inaccessible to them. Students will have read access to courses in which they are enrolled in, and will have write access to assessments posted by their instructor. System administrators are the only users that will have full access to the software including access to the internal database. These abstractions will make the product more robust, and thus lead to less user-invoked errors.
Performance	Since this software will run in a university/college setting, an average large class would be around 200 users. But we are expecting much larger classes that maybe more than 400 students. Also, we anticipate that it will be used in different places (such as homes or even cities). Due to this, we require it to be extremely responsive while navigating between web pages. Additionally, any read/write operations done on the internal database should not cause noticeable lag in the product. The performance of the product should also not decrease when the number of users on it increases.

Table 2: Test Factor and Rationale

Testing Method

Since this software is web-based, it makes sense to initially go through the various test cases manually. This testing will be primarily done by point-click actions on the GUI via different supported mobile devices. These include laptops (Windows/OSX/Linux), Apple iPhone / iPad, Android smartphones and tablets. On the mobile devices it will be tested on their respective Internet Browsers such as Google chrome, Apple Safari, and Mozilla Firefox etc. Once this product has gained some stability, test cases will be automation software called “Selenium”. Selenium will record mouse clicks, key presses, POST/GET inputs etc. This will automate and simulate what the user will do in reality. We expect to do this as the product progresses towards stability in the New Year. For stress testing we will be using Apache JMeter. JMeter can automate and simulate concurrent user log-in and app usage.

Types of Tests:

Structural Testing

Structural testing is a validation test that is done at the code level to make sure the internal mechanisms of the software output an expected result. This type of test will be validated via the following tests:

- 1) Validating whether entries are being written to the database correctly
- 2) Ensuring that instructors and students are not able to see other instructors' and students' information
- 3) Data Analysis: calculation and graphs are being calculated correctly

Functional Testing

Functional testing is a verification test to see if the software works according to the requirements. This is also an alternate name for black box testing. This type of test will be validated via the following tests:

- 1) Stress testing: This test is done to see if the server and the software can perform normally when under large amount of requests.
- 2) Question type: There are two types of questions that can be used: multiple-choice and short-answers. We need to make sure that both types of questions are recorded into the database correctly. Also for short-answers we have to make sure that the database will support at least a paragraph length answer.
- 3) Analyzing results: After each class / lecture, the instructor will be able to review the student's answers, and obtain data analysis (such as a graph of correct answers vs. incorrect answers, time spent per answer etc.).
- 4) Portability: Every user will have their own electronic devices such as a laptop or mobile phone. Due to this, we need to make sure that our software will display and work properly no matter what device the users are using. These devices include Apple iPhone, iPad, Android smartphone / tablets, Internet Browsers (Chrome, Firefox, Safari).

Unit Testing

Unit testing is a test that validates specific groups or units within the program. Unit testing falls under white-box testing - validates that the implementation of the product is producing an expected result. Our unit testing may be similar to functional testing. However, our unit testing is grouped into the follow units: system administrator, instructor and students. Instructors and students will be tested on:

- 1) The ability to modify their own courses (add / remove)
- 2) Students should be able to review previous lectures.
- 3) Instructors should be able to modify their own courses that they teach, and also the contents of it.
- 4) Instructors can view the Data Analysis page.

Static vs. Dynamic Tests

Static testing is done through code reviews. Dynamic testing is when we validate software by executing various test cases on it. To implement static testing in our software, we have imposed a policy where all major code changes needs to be notified to the whole group. This will allow us to avoid careless code bugs in our software. As the year progresses, we will be executing various test cases on our software. For a detailed test timeline, please read "Testing Schedule (Tentative)".

Manual vs. Automated tests:

Manual testing is when the tests are done by hand, while automated testing is done automatically by software. Manual testing is cheaper, more flexibility and will find more real-user issues. Whereas automated testing is much faster, more expensive, and has limitations on what it can test. Both manual and automated testing will be used. Manual testing will focus on UI (User Interface), making sure fonts, colors, and the position of buttons is correct. There will also be tests to make sure everything is aligned properly with different browsers. Automated testing will be done by Selenium.

Test Cases:

Test cases 1 - 19 are also included for POC testing.

Test cases	Scenario	Expected Behaviour	Negative result
1. Logging in with a Password - Student	- Input student's username and password on main login homepage and click login	- Redirected to student's individual homepage	Wrong user name or password message pop up.
2. Logging in without a Password - Student (Non-Registered Student)	- Input student's user name ONLY on main login homepage and click login	- Redirected to course selection page	- Username in use error message - No Class Found error message
3. Logging in with a Password - Instructor	- Input instructor's username and password on instructor's login homepage and click login	- Redirected to instructor's individual home page	- Wrong user name or password message pop up.

4. Logging in - System Administrator	- Input System Administrator's username and password on System Administrator login homepage and click login	- Redirected to System Administrator Management page	- Wrong user name or password message pop up.
5. Password type specification	- Typing in different sets of combinations for user's password in the various login homepage	- Upper/Lower case letters and number combination, 260 characters restricted password should be accepted	- "Password Format is wrong" error message
6. Password field is empty - Student	- When logging in as a student, do not type in any password, and click login	- This will be treated as a non-registered student if the same username is not used in the system	User name is already exists message
7. All the buttons should have correct functionality	- On the various login homepages, click on following buttons: - Login Button - Register Button	- Login will process login operation - Register will direct user to register page	
8. "Add Course" button - Student	- Log in as a student - Click "Manage Courses" - Select "Add Course"	- Redirected to "Add Course" web page	
9. "Quit Course" button- Student	- Log in as a student - Click "Manage Courses" - Select "Quit Course"	- A warning stating "Are you sure you want to quit this course - ####?" appears.	
10. "Go Back" button - Student	- Log in as a student - Click "Manage Courses" - Click "Go Back"	- Redirected back to student's individual home page	
11. "Add Course" button - Instructor	- Log in as a instructor - Click "Manage Courses" - Click "Add Course"	- Redirected to "Add Course" web page	
12. "Delete Course" button - Instructor	- Log in as a instructor - Click "Manage Courses" - Click "Delete Course"	- Redirected to "Delete Course" web page	
13. "Go Back" button - Instructor	- Log in as a instructor - Click "Manage Courses" - Click "Go Back"	- Redirected back to instructor's individual home page	
14. Populating questions with multiple choice	- Log in as a instructor - Using the GUI interface, navigate to "Add Questions" web page	- Instructor will be directed to the course page and the new	

answers - Instructor	<ul style="list-style-type: none"> - Type in the Question title, and content - Choose “Multiple Choice” as the answer type - Fill in each option - Click Add 	question will show in the question list.	
15. Populating questions with text form answers - Instructor	<ul style="list-style-type: none"> - Log in as a instructor - Using the GUI interface, navigate to “Add Questions” web page - Type in the Question title, and content - Choose “Text Form” as the answer type - Fill in each option - Click Add 	- Instructor will be directed to the course page and the new question will show in the question list.	
16. Populating questions with number form answers - Instructor	<ul style="list-style-type: none"> - Log in as a instructor - Using the GUI interface, navigate to “Add Questions” web page - Type in the Question title, and content - Choose “Number Form” as the answer type - Fill in each option - Click Add 	- Instructor will be directed to the course page and the new question will show in the question list.	
17. Answering number form questions - Student	<ul style="list-style-type: none"> - Execute Test Case 16 - Login as a student - Navigate to the Course - Click “Go to Class” put in answers. - Submit 	The student will be directed to solution page that contains the correct answer and the answer he/her submitted.	
18. Answering text form questions - Student	<ul style="list-style-type: none"> - Execute Test Case 15 - Login as a student - Navigate to the Course - Click “Go to Class” put in answers. - Submit 	The student will be directed to solution page that contains the correct answer and the answer he/her submitted.	
19. Answering multiple choice form questions - Student	<ul style="list-style-type: none"> - Execute Test Case 14 - Login as a student - Navigate to the Course - Click “Go to Class” put in answers. - Submit 	The student will be directed to solution page that contains the correct answer and the answer he/her submitted.	
20. Add a Course - Instructor	<ul style="list-style-type: none"> - Login as a instructor - Click “Manage Courses” 	Instructor will be directed to the new	The following message: “Missing

	<ul style="list-style-type: none"> - Click “Add a Course” - Fill in the required information about the course, and click Add. 	added course page with all the correct information.	Required Information to create a course” will appear.
21. Delete a Course - Instructor (Confirmed)	<ul style="list-style-type: none"> - Login as instructor. - Click “Manage Course” - Click Delete course. - Choose the course. - Click Delete. - Click “Yes” to confirm deletion. 	Instructor will be directed to the manage course page.	The following message: “No course is chosen, therefore no action has taken.” will appear.
22. Delete a Course - Instructor (Not confirmed)	<ul style="list-style-type: none"> - Login as instructor. - Click “Manage Course” - Click Delete course. - Choose the course. - Click Delete. - Click “No” to cancel the deletion 	Instructor will be directed to the manage course page. And the course will still exist.	The following message: “No course is chosen, therefore no action has taken.” will appear.
23. Add a Course - Student	<ul style="list-style-type: none"> - Login as a student - Click “Manage Courses” - Click “Add Course” - Type in the Course Code - Click Ok 	Student will be directed to the New Course’s homepage.	The following message: “Course code not exists, please check it and enter it again” will appear
24. Student Quits Course (Confirmed)	<ul style="list-style-type: none"> - Login as a student - Click “Manage Courses” - Click “Quit Course” - Choose the course - Click “Ok” - Click “Yes” to confirm action 	Student will be redirected to the “Manage Courses” web page and the course is not in list anymore.	The following message: “No Course is chosen, therefore no action has been taken” will appear.
25. Student Quits Course (Not Confirmed)	<ul style="list-style-type: none"> - Login as a student - Click “Manage Courses” - Click “Quit Course” - Choose the course - Click “Ok” - Click “No” to cancel the action 	Student will be redirected to the “Manage Courses” web page and the course is still in list.	The following message: “Course code not exists, please check it and enter it again.” will appear.
26. Add an Instructor - System Administrator	<ul style="list-style-type: none"> - Login as a System Administrator - Click “Add a Instructor” - Type in the Instructor’s name, email address, email address, office, office hour, faculty, phone number and set the initial password. - Click Create. 	System Administrator will be redirected to the home page. The Instructor will show up in the list of instructors.	The following message: “Not enough information, please fill in all the requirement blanks.” will appear.

27. Delete an Instructor - System Administrator (Confirmed)	<ul style="list-style-type: none"> - Login as a System Administrator - Click "Delete a Instructor" - Choose the instructor - Click Delete - Click Yes to confirm the deletion 	System Administrator will be redirected to the homepage. The deleted instructor will not show up on the list of the instructors.	The following message: "No instructor is selected, therefore no action is taken" will appear.
28. Delete an Instructor - System Administrator (Not Confirmed)	<ul style="list-style-type: none"> - Login as a System Administrator - Click "Delete a Instructor" - Choose the instructor - Click Delete - Click No to cancel the action 	System Administrator will be redirected to the homepage. The instructor will still show up on the list of the instructors.	.
29. Performance Testing (1-100 users)	Ask more than 50 students to login and answer one question at same time. Record the time cost for one student. Ask 1 student to login and answer the same question, make sure no other access exist at same time. Record the time cost.	The time spent for 1 user and 100 users to access the same amount of data at the same time should be same.	
30. Usability Testing	<ul style="list-style-type: none"> -Conducting a field test by using InPress in a live lecture. - Ask students for feedback. 	The interface layout is same across browsers. No noticeable errors occur.	
31. Mobile Friendly - iPhone, Android	<ul style="list-style-type: none"> - Run through test cases 1 - 29 with the following devices: Apple iPhone/iPad, Android phone/tablet. - Ensure all interface layout looks the same between browsers. 	The interface layout is same across devices. No noticeable errors occur.	

Table 3: Test Cases

Summary

This test plan is based on all the functional and non-functional requirements, includes the test cases we should run and verify for our product. The purpose of this plan is to verify the daily, regression and POC testing of this product. This test plan is subject to change, and test cases will be added or deleted as needed.

Testing Schedule (Tentative)

Date	Summary
Wednesday October 30/2013	Proof of Concept test cases must be complete
Tuesday November 06, 2013	Proof of Concept GA Build Deadline
Tuesday November 06, 2013	Proof of Concept Testing Phase. Only critical

- Friday November 8, 2013	code defects will be allowed to be delivered.
Monday December 2, 2013 - Monday December 30, 2013	Refine test cases with any new requirements, and/or changes to the design of the product
Wednesday January 1, 2014 - Wednesday February 5, 2014	Unit testing for various features during development phase.
Wednesday March 5, 2014	Final Product GA Build Deadline
Wednesday March 5, 2014 - Monday March 24, 2014	Final manual testing of test cases. Automated testing framework should also be setup, and all test cases should be automated. Only critical defect fixes will be allowed to be delivered during this period.

Table 4: Testing Schedule