Steady Upward Course Project Report

Quinn Briggs

Spring 2023
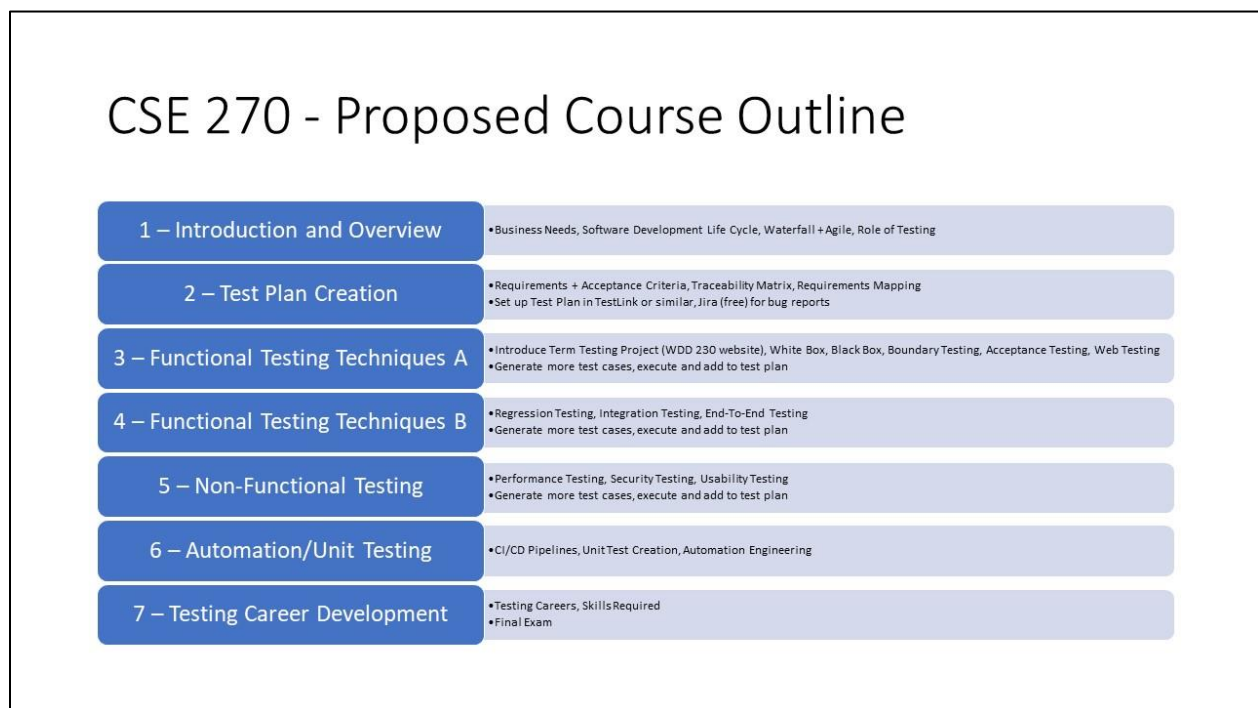
Overview

The CSE 270 Software Testing course taught in person needed some updating this semester. The online learning area also wanted to turn this into a "block" level class with 7 lessons. I wanted to use this course as my proving ground for changes I learned about in this class while accomplishing the goals of the department for this class. Each section of this document shows in more detail what I did this semester as I updated this course and used what I learned in class.

Reconsider the 10,000-foot view of my course

The current class consists of 14 lessons which teach aspects of the discipline of software testing. One drawback is that each week is somewhat self-contained, and the previous week's efforts don't always lead into the next week's lesson. Another course drawback is that it's currently heavy on theory and could use more hands-on lab experiences.

Working with my colleagues Gary Godderidge (course lead) and Craig Lindstrom (online lead) we came up with this course outline.

CSE 270 - Proposed Course Outline

Lesson	Topics
1 – Introduction and Overview	• Business Needs, Software Development Life Cycle, Waterfall + Agile, Role of Testing
2 – Test Plan Creation	• Requirements + Acceptance Criteria, Traceability Matrix, Requirements Mapping • Set up Test Plan in TestLink or similar, Jira (free) for bug reports
3 – Functional Testing Techniques A	• Introduce Term Testing Project (WDD 230 website), White Box, Black Box, Boundary Testing, Acceptance Testing, Web Testing • Generate more test cases, execute and add to test plan
4 – Functional Testing Techniques B	• Regression Testing, Integration Testing, End-To-End Testing • Generate more test cases, execute and add to test plan
5 – Non-Functional Testing	• Performance Testing, Security Testing, Usability Testing • Generate more test cases, execute and add to test plan
6 – Automation/Unit Testing	• CI/CD Pipelines, Unit Test Creation, Automation Engineering
7 – Testing Career Development	• Testing Careers, Skills Required • Final Exam

I decided I would try out this new concept for the class which included significant rewrites of existing course materials, including summative and formative assessments. The hope was that this allows time for additional revisions in the fall before it's taught again both online and in person in Winter 2024.

To facilitate this outline, I am introducing a single "system under test" which we will test throughout the semester. This is a sample web site I previously created for another class. After about 2 weeks of overview and preparatory material, we introduce our test system gradually. We explore all the phases of software development and what role testing plays along the way.

In addition to having a single "system under test" that we use throughout the semester, I also have instituted a weekly cadence.

- Monday: Instruction and cover preparatory materials from the reading quiz.
- Wednesday: Group activity that reinforces the concepts and introduces hands-on work
- Friday: Lab time with guided instruction as needed to complete individual assignments.

This cadence of classes has seemed rather effective and students who miss Wednesday group activities are able to make them up by doing an alternate assignment. Here is an example of a typical week's activities.

The Overview/Reading items are covered on Monday.

The Teach in class activity is done on Wednesday in class

The remaining Prove activities are discussed in detail on Friday and help is given as needed.

A full before and after PDF of the course before the redesign and after the redesign are included with this write up in the assignment submission.

Change what technology I integrate into the course

A significant part of this course was giving instructions on how to set up testing or testing tools. Initially I used screenshots and walkthroughs in Canvas to explain what needed to be done. One week, a student approached me and said that the walkthroughs were confusing to him. He wondered if I would make a video instead.

That week, I learned how to use Kaltura Capture and started including video walkthroughs of the assignments along with the written instructions. I think this ended up being a very effective use of videos. Time permitting, I intend to go back to previous weeks and add video instructions to the screenshot instructions I currently have.

In addition to instructional technology, I have integrated new software testing tools into the course that are widely used in the industry including JIRA, Postman, ChatGPT, Selenium IDE and GitHub Actions. We also use Python for automated testing. Each of these tools is used to help the students gain experience with real-world testing tools that they may use in their work. These updates are found throughout the Teach and Prove assignments in the new course.

Change how I group students for collaborative work

Early in the semester, the class is divided into groups of about 2-3 students each. During the semester it became clear that while some groups were doing just fine with the assignments, other groups were struggling mightily. Some students came to me and asked for help because they were carrying the load for their groups.

Starting about week 8, I decided to take the anxiety of group work more out of the class. I designed group activities that could be performed in class with whoever was present and an alternate activity for those who were not. This allowed the groups that were functioning well to continue to collaborate with each other while the groups that were not functioning well could float and work with others in the class. This has worked very well, and I will take another look at earlier group assignments to see if similar adjustments can be made.

For example in week 9, our Usability test was an in-class activity done in pairs. Students could pair up with others in their own group, or pair with someone at another table close by. In groups where some of the group members didn't come to class, the students who showed up just paired up with another student nearby.

Those who did not come to class were asked to do the assignment with a roommate for family member.

W09 Teach: Conducting a Usability Test (in-class activity)

✓ Published   ✎ Edit   ⋮

Overview

The 1.2 version of the Teton Idaho Chamber of Commerce web site was released, but signups are slow. The team felt like the Join form was a key problem, because it was asking for too much information up front. For the 1.3 release, the new idea is to turn the Join page into a "wizard" where information is collected more gradually. The stakeholders want to do a usability study on this new version of the Join page to see what can be learned.

In today's lab, you will need to work with a single partner. One partner will work on the tasks specified in the usability study while the other observes and takes notes. The user should vocalize their thought process as they do the tasks. Then the roles will reverse and the other partner will work on the tasks while the other observes and takes notes. Then, you will submit your findings individually.

If you were unable to attend class, the usability study must be completed with a roommate or family member acting as the user.

Instructions

Open the test plan document found here. Teton CoC Usabilty Test Plan ⤇

Navigate to the Teton Chamber of Commerce Site v1.3 Join Page ⤇ to conduct the test.

Change some formative assessments

Because the content of the class changed and the outline of the class changed, formative assessments used each week had to be changed. I use the formative assessments to allow the students to practice the concepts taught each week. You can see the changes by comparing the Winter 2023 PDF with the Spring 2023 PDF attached to the assignment.

The students understand that they are part of a course that is under revision, so I asked for feedback each week so I know if there are errors or omissions in my redesigned assessments. I have received good feedback from several students and have made needed adjustments each time.

Change a summative assessment

The current summative assessment for the class is a final exam given in Week 14. After reviewing the final, it became clear that much of the new material is missing from the exam, and other material

covered in the previous version of the class is no longer covered. I have created a new final exam that covers the material in the revised class.

Old Test:

W14 Final Exam

Due Apr 4 at 11:59pm	Points 132	Questions 27	Time Limit None

Instructions

Overview

Purpose: A summative quiz about each of the topics in the course.

Task: Complete all questions.

Grading: Automatic grading of multiple choice, multiple select, and matching.

Preview

‹ Previous   Next ›

New Test:

W14 Final Exam

Overview

This final exam is taken from the content we have covered all semester long. It is meant to be comprehensive, meaning there will be questions from each week's material to consider. The exam is open note - meaning you can use the slides and other resources provided by the instructor this semester.

Instructions

For each question, choose the best answer. Submit your quiz for grading when complete. If you have concerns about a question you got wrong, take a screen shot of your answer to the question you have concerns with and reach out to the instructor **after** the test.

Quiz Type	Graded Quiz
Points	200
Assignment Group	Ponder & Prove
Shuffle Answers	Yes
Time Limit	No Time Limit
Multiple Attempts	No
View Responses	Always
Show Correct Answers	No
One Question at a Time	No

Due	For	Available from	Until
Jul 17	Everyone	Jul 17 at 12:01am	Jul 17 at 11:59pm

Change the texts that I use and how I use them

The current texts for the class are somewhat dated. One dates from 2005 and the others from 2017. While many of the concepts in these texts are still valid, the examples are horribly dated, and references are made to programs that are no longer in use.

In the new version of the class, I retained some of the text, but used much less of it, only referring to the sections that are still relevant. I augmented the reading assignment with recent industry blog posts that demonstrate current industry thinking about software testing concepts. I also used the latest industry research reports to demonstrate current industry practices and incorporated them in my lectures.

I adjusted the reading quizzes to account for this new information and to ensure students were getting the most out of the reading. One piece of feedback I received is that I may have put too much reading in the quizzes. This is something that will need to be adjusted in the future.

Here's an example of a quiz with more current content

W06 Reading: Test Cases and Tools

⚠ This is a preview of the published version of the quiz

Started: Jul 13 at 9:59am

Quiz Instructions

Read the following articles or book excerpts:

Take the quiz to indicate you have read these articles.

==

Chapter 18: Writing and Tracking Test Cases from Software Testing, Second Edition, Ron Patton

https://learning.oreilly.com/library/view/software-testing-second/0672327988/ch18.html ⤷

How to Write Test Cases: A Step-by-Step QA Guide - Coursera.org

https://www.coursera.org/articles/how-to-write-test-cases ⤷

Writing Test Cases from User Stories & Acceptance Criteria - TestLodge.com

https://blog.testlodge.com/writing-test-cases-from-user-stories-acceptance-criteria/ ⤷

Tester's and Developer's Mindset - ToolsQA.com

https://www.toolsqa.com/software-testing/istqb/testers-and-developers-mindsets/ ⤷

Alter my late work policies, attendance policies, or classroom procedures

For this version of the class I instituted a no-late penalty policy. I also extended the due dates for individual assignment to the next Monday rather than the typical Saturday. Students that were anxious to work ahead typically got their assignments in before the end of the week and others would do it on

Monday. Monday became a day where I could revisit issues with the assignments from the previous week without students feeling stressed that they hadn't completed it before Saturday.

If you look at the figure of Week 9 on page 2 in this document, you will see that the reading quiz was due Tuesday (material covered in class Monday), the in-class activity we did Wednesday, but the report was due Thursday, and the individual Prove assignments were discussed in class Friday, but students had until the following Monday to turn them in.

Redo my own office hours to make my use of time more efficient

All semester long I have kept consistent office hours 2:00 – 3:00 each day. What I found is that some students couldn't make that work. Towards the end of the semester more students were reaching out to me for assistance, and managing time was becoming more difficult. In the progressing teacher class I was taught how to set up Calendly for my students, which I have now done. This has already been a tremendous help both to myself and to the students who want to meet with me.

Here's a screenshot of the Calendly sign up form I am now using:

Conclusion

This semester was a unique opportunity for me to level up my skill as an instructor. I've learned a lot from taking this course and directly applying it immediately to a class that I was working on. I think these adjustments will serve me well now and in the future.