BeachCS

Test Specifications

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	Summary of changes: 6. Added module testing for Programming Guides 7. Added module testing for Possible interview questions 8. Add Job Success page to Module Level Testing 9. Add Conquering the Career Fair page to Module Level Testing 10. Add Minor in Cyber Security Applications page to Module Level Testing 11. Add Scheduling Classes page to Module Level Testing 12. Remove Unit Test: Login with Username and Password 13. Modify View Course Descriptions on Unit Level Testing 14. Modify Select a Course Description Card on Acceptance Level Testing 15. Replace Login on Acceptance Level Testing with Feedback 16. Modify View Masters on Unit Level Testing 17. Added module testing for Ways to study 18. Added module testing for Motivation 19. Added module testing for IDEs 20. Added system testing for Website Responsiveness

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Abstract

This document will outline the five Test Cases used to verify the integrity of the BeachCS web application. Tests will be conducted and discussed on the following levels of testing: Unit, Module, Integration, System, and Acceptance Testing. The tests performed will assist in dealing with different situations that may arise in the system when the User is utilizing our web application. In doing so, we will ensure that the product meets the numerous Requirements detailed in the Requirements Specification. Each test will compose of the following six categories:

1. **Test Level**: Level of testing, includes unit, module, integration,system and acceptance testing.
2. **Quality Criterion**: ISO 25010 specifies quality attributes such as effectiveness, efficiency, satisfaction, freedom from risk and context coverage.
3. **Description of Test:** Brief overview about the test.
4. **Requirements reference**: Use case(s) the functionality refers to.
5. **Steps of the Test Case**: Actions the user should take to reach this test case.
6. **Expected Outcome**: Output result of proposed test case.

Unit Level Testing

Testing the individual units or components of the software to validate the individual functionality of those software components. Unit testing is on a scale that usually it takes in one or few inputs and gives out a single output. Unit testing increases confidence in software maintenance and code modifications.

Login with Username & Password

Test Level	Unit
Quality Criterion	Functional suitability, Performance efficiency, Security
Description of Test	Given a username and password, the web application will check if the user can be authenticated.
Requirement Reference	Use Case 7: User Login
Steps of Test Case	● Check if username is not empty ● Check if password is not empty ● Check if the username is in the database ● Retrieve the correct password for the username from the database ● Compare the entered password to the correct password ● Authenticate the user
Expected Outcome	● If the username or password is empty, authentication fails ● If the username and password do not match, authentication fails ● If the username and password match, authentication succeeds

View Course Descriptions

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access the list of CS courses offered at CSULB
Requirement Reference	Use Case 2: User can view prerequisites, descriptions, and class numbers of all CS courses
Steps of Test Case	● User selects the Get Started option ● User selects the Course Explorer option ● View list of courses ● User selects desired course to view relevant course information
Expected Outcome	● User can find additional information about an individual CS course

View Degree Planner

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access an updated CS roadmap
Requirement Reference	Use Case 4: User can view a degree planner generated for that user
Steps of Test Case	● User selects the Get Started option ● User selects the Course Explorer option ● User selects the View Roadmap option ● User selects courses to add to degree planner ● Generate degree planner ● View degree planner
Expected Outcome	● User can view a generated degree planner based off the classes he/she selects from the roadmap

View Coding Skills

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access the list of coding skills to find more information
Requirement Reference	Use case 6: User can access different websites that enhance coding skills
Steps of Test Case	● User selects the Get Started option ● User selects the Academics option ● User selects the Enhance Coding Skills option ● View list of various coding skills ● Select desired coding skill to navigate to a website that provides tutorials on that particular skill
Expected Outcome	● User can gain access to different websites that enhance particular coding skills

View Masters

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access the masters section of the web application to learn more about obtaining a post-bachelor's degree
Requirement Reference	Use case 18: User can access information regarding the Computer Science Masters program at CSULB
Steps of Test Case	● User selected the Get Started option ● User selects the Academics option ● User selects the Masters Program option ● View information regarding the CS masters program at CSULB
Expected Outcome	● User can gain access to the masters section of the web application

Module Level Testing

Testing smaller building blocks of the software rather than testing the whole software altogether. These building blocks or modules can be individual class, subroutines, or subprograms.

Home Page Viewer

Test Level	Module
Quality Criterion	Usability, Efficiency
Description of Test	User enters main page and is able to click “Get Started” map to navigate the website
Requirement Reference	Use Case 1: User successfully enters main home page Use Case 3: “Get started” button redirects user to Getting Started page
Steps of Test Case	● Enter CSULB wiki home address ● Navigate the “Get Started” button ● Click “Get Started” button ● Result of click should redirect user to Getting Started page
Expected Outcome	● User should be able to access CSULB wiki efficiently with no bugs. ● Main page is redirected to Getting Started page after “Get Started” button is clicked

Course Explorer Page

Test Level	Module
Quality Criterion	Usability, Functionality, Efficiency
Description of Test	User clicks is redirected to the appropriate card
Requirement Reference	Use Case 9: User is redirected to Course Explorer page Use Case 10:User is redirected to Guides page Use Case 11:USer is redirected to Career page Use Case 12:User is redirected to Academics page
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select one of the following: ○ Course Explorer

	○ Guides ○ Careers ○ Academics
Expected Outcome	After clicking the desired Card from the Getting Started page, the user should be able to transition to the select page successfully

Guides Page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access Guides page and be redirected to the select link by clicking the appropriate button attached to it.
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click one of the following buttons ○ Show me ○ Find Clubs! ○ Tutoring Center
Expected Outcome	Once a user successfully access Guides page: ● “Show me” Button should redirect user to CSULB student affairs main page. ● “Find Clubs!” button should redirect user to CSULB club page ● “CSULB TUTORING CENTER” button should redirect user to the CSULB computer science tutoring center page site. ● “Programming Guides” link redirect user to Programming Guides page ●

Career Page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Career page and be able to navigate and click select links.

Requirement Reference	Use case 14: User can access Career page and navigate between links
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Career card ● Click one of the following links ○ Success workfairs ○ Crafting your resume ○ How to Succeed at your Job
Expected Outcome	After successfully accessing Career page: ● Success workfairs should display a list of current or upcoming school workfairs and a description of what to expect during the workfair ● Crafting your resume will provide details and resources on what should be included on a competitive resume along with tips regarding common proper formatting for most professional resumes. ● How to Succeed at your Job will display a list of current or past Employees/Employers blogs, work stories, or brief summary of what to expect at a computer science related field job/career.

Academics Page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Academics page and be able to navigate and should be able to view data and information regarding computer science related subjects.
Requirement Reference	Use case 15: User access Academics page
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Academics card
Expected Outcome	After successfully accessing Academics page, user should be able to see a list and post of useful computer science tips, hints, tutorials and motivated speeches to help the user succeed academically at CSULB.

Integration Level Testing

Integration testing is a level of testing where software modules are integrated logically and tested as a group. A typical software project consists of multiple software modules, The purpose of this level of testing is to expose defects in the interaction between these software modules when they are integrated.

Interaction with MySQL

Test Level	Integration
Quality Criterion	Functionality
Description of Test	User interact with the web application, navigate through screens, performing actions, and viewing certain content with all communication to MySQL.
Requirement Reference	Most use cases.
Steps of Test Case	● Most actions
Expected Outcome	● On Functioning MySQL, course list, course description, and other functionality will be tracked by and reported to the MySQL console.

Email Confirmation (Reliability)

Test Level	Ingreation
Quality Criterion	Reliability
Description of Test	Check that account creation sends proper emails to the correct servers for confirmations
Requirement Reference	Use Case 7: User Login
Steps of Test Case	● Navigate to the sign-up page ● User fills out email information for login ● Enter a valid email ● Verify email was sent to the appropriate
Expected Outcome	Email confirmation is working properly and emails are sent to the proper server

Interaction with Git repository

Test Level	Ingreation
Quality Criterion	Reliability
Description of Test	Check that the implemented code was integrated properly with other content of software
Requirement Reference	Most use cases
Steps of Test Case	● Enter the site url ● Validate the site is up and running ● Verify functionalities of the web application ○ Check all pages ● Repeat steps 1 - 4 with different browsers
Expected Outcome	Software is working properly

Interaction with interactive Roadmap

Test Level	Ingreation
Quality Criterion	Functionality
Description of Test	Users interact with the web application, navigate through the roadmap, perform actions, and view course content with all communication to MySQL.
Requirement Reference	Use Case 4: User can view a degree planner generated for that user
Steps of Test Case	● User selects the Get Started option ● User selects the Course Explorer option ● User selects the View Roadmap option ● User selects courses to add to degree planner ● Generate degree planner ● View degree planner
Expected Outcome	Software is working properly

Interaction with cards appearing on the “Getting Started” page

Test Level	Ingreation
Quality Criterion	Functionality
Description of Test	Users interact with the web application, navigate through the “Get Started” page, perform actions, and view cards for application pages.
Requirement Reference	Use Case 4: User can view a degree planner generated for that user
Steps of Test Case	● User selects the Get Started option ● User has option to select from: ○ Course Explorer Card ○ Career Card ○ Guide Card ○ Academics Card ● User views specific card
Expected Outcome	Software is working properly

System Level Testing

Test the fully integrated application to check for any issues involving the different components and how they work alongside the system. The application is tested to examine any server or user experience issues that may arise while the application is running. A running application should be able to incorporate the different components and run smoothly

Website Uptime

Test Level	System
Quality Criterion	Reliability
Description of Test	Check that the website maximizes the time it is available to users
Requirement Reference	Most use cases
Steps of Test Case	● Utilize AWS Cloudwatch to monitor website performance ● Free tier available, can be scaled up for more website visitors

Expected Outcome	Monitoring metrics will show that the website is available for users the vast majority of the time with little to no downtime.

Website Recovery

Test Level	System
Quality Criterion	Reliability
Description of Test	Check that the website can be recovered after crashing from receiving a large influx of simultaneous users or other system failure
Requirement Reference	Most use cases
Steps of Test Case	● Utilize Loader(https://loader.io/) to stress test web application ● Run test with an increasing amount of virtual users ● After website crashes, utilize instance hosted on AWS ● Either ○ Automatically rehost the website with built-in AWS services ○ Manually rehost the website
Expected Outcome	Website will be accessible again even after a system failure and/or crash

Browser Compatibility

Test Level	Integration
Quality Criterion	Compatibility, Portability
Description of Test	Check that the complete site and functions can run on various Browsers and Systems
Requirement Reference	Most use cases
Steps of Test Case	● Open various internet browsers ● Enter the site url ● Validate the site is up and running ● Verify functionalities of the web application ○ Check all pages ● Repeat steps 1 - 4 with different browsers
Expected	The web application should be reachable and usable from multiple different

Outcome	browsers and systems for the user can use.

Database Integrity

Test Level	System
Quality Criterion	Security
Description of Test	Check that the database is inaccessible to those without permission for modification
Requirement Reference	Use Case 5: Maintain course and user information in a secure database
Steps of Test Case	● Attempt to enter the database without login info ● Attempt to use the form to alter the database without being logged in as a user with edit permission
Expected Outcome	No changes or direct access to the database will be allowed without having the correct privileges

Page Creation

Test Level	System
Quality Criterion	Maintainability
Description of Test	Check that pages such as specific guides can be added to the website
Requirement Reference	Use Case 16: Create guides to assist students in educational and career prospects
Steps of Test Case	● Add a page that can be linked to through “Guides”
Expected Outcome	More pages will be created, accessible from the “Guides” page

Acceptance Level Testing

In Acceptance Testing, the website is tested for its compliance to the business requirements. This is to verify that the application meets the user's expectations and behaves as anticipated. It will also help identify and prevent scenarios where the user may run into issues with the application.

Account Creation

Test Level	Acceptance
Quality Criterion	Functionality, security, usability
Description of Test	User is able to create and administrative account by entering valid data that has not been associated to any other existing account on CSULB wiki's database
Requirement Reference	Use case 8: User can register for account Use Case 7: User login
Steps of Test Case	● Enter site and navigate main menu page ● From the Navbar Click on "Account" button ● After user is redirected, enter appropriate required information ● Database server verifies no existing account exists with data given ● Server sends confirmation email to user ● User then verifies account through valid email confirmation ● Server verifies email confirmation ● User account is successfully created and the user is able to get administrative permission to the website.
Expected Outcome	User's account is verified and gets granted administrative privileges.

Login

Test Level	Acceptance
Quality Criterion	Functionality, Reliability, Usability, Security
Description of Test	User provide valid credentials to login into the administration application after an account has successfully been created.
Requirement Reference	Use case 8: User can register for account Use Case 7: User login

Steps of Test Case	● Enter site and navigate main menu page ● From the Navbar Click on “Account” button ● After user is redirected, enter appropriate required information ● Database server verifies no existing account exists with data given ● Server sends confirmation email to user ● User then verifies account through valid email confirmation ● Server send a request and verifies account ● User logs in and is able to use
Expected Outcome	● User is logged in and on home page

Select a course description card

Test Level	Acceptance
Quality Criterion	Functionality, Usability, Efficiency
Description of Test	User selects a course description card from the existing course catalog which will reveal course information.
Requirement Reference	Use Case 2: User can view prerequisites, descriptions, and class numbers of all CS courses
Steps of Test Case	● User selects the Get Started option ● User selects the Course Explorer option ● View list of courses ● User selects desired course to view relevant course information
Expected Outcome	● User sees more information about selected course

Add Classes

Test Level	Acceptance
Quality	Operability

Criterion	
Description of Test	After creating an account in the server, the User now has administrative permissions and can add a class to the courses database
Requirement Reference	Use Case 17: Administration can add new courses to the database
Steps of Test Case	● Enter site and navigate main menu page ● From the Navbar click on “Account” button ● User logs in with administrative email and password ● User navigates to Course Explorer page ● User clicks on “Add Course” ● User inputs the course information in the required fields ● Web app verifies the course number inputted does not match any other course numbers in the database ● If it does not, the course is successfully added
Expected Outcome	After the user adds a new course and refreshes the Course Explorer page, the new course should now be displayed as one of the courses.

Roadmap Usage

Test Level	Acceptance
Quality Criterion	Usability (Learnability, Operability, User interface aesthetics)
Description of Test	Check if user can easily maneuver and read the Computer Science major roadmap
Requirement Reference	Use Case 4: User can view a degree planner generated for that user
Steps of Test Case	● User selects the Get Started option ● User selects the Course Explorer option ● User selects Course Roadmap ● User clicks various course buttons and reads course descriptions ● User chooses a certain course and attempts to determine its prerequisites and corequisites
Expected Outcome	User is able to analyze the roadmap for course information that they need and follow which courses come before and after others in the roadmap

Appendix

Amendment 1: Change “View Degree Planner” to “View Degree Roadmap” in Unit Level Testing

Amendment 2: Add Degree Roadmap Card test to Module Level Testing

- Degree Roadmap Card

Test Level	Module
Quality Criterion	Usability (Operability), Efficiency
Description of Test	When a course node is clicked, the Degree Roadmap card updated with the relevant course information, such as prerequisites
Requirement Reference	Use Case 4: User can view a degree planner generated for that user
Steps of Test Case	● Click node in Degree Roadmap ● Confirm that information on the card appears ● Check that the information that appears on the card is correct
Expected Outcome	● Degree Roadmap card should update every time a new node is clicked ● Contents of Degree roadmap card should be accurate with proper formatting

Amendment 3: Change this Integration test to Interaction with cards appearing on Home page

Amendment 4: Added to Module level testing on Guides page

- Guides Page

Test Level	Module
Quality Criterion	Usability, Functionality

Description of Test	Users should be able to successfully access Guides page and be redirected to the select link by clicking the appropriate button attached to it.
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click one of the following buttons ○ Show me ○ Find Clubs! ○ Tutoring Center ● Some helpful Guides click one of the following links ○ Programming Guides ○ Possible Interview Questions ○ Ways to Study ○ Recommended IDE’s ○ For Motivation
Expected Outcome	Once a user successfully access Guides page: ● “Show me” Button should redirect user to CSULB student affairs main page. ● “Find Clubs!” button should redirect user to CSULB club page ● “CSULB TUTORING CENTER” button should redirect user to the CSULB computer science tutoring center page site. ● “Programming Guides” link redirect user to Programming Guides page ● “Possible Interview Questions” link redirects user to Possible interview questions page ● “Ways to Study” link redirects user to ways to study page ● “Recommended IDE’s” link redirects user to Recommended IDE’s page ● “For Motivation” link redirects user to for motivation page

Amendment 5: Added Unit Level Testing on Career page

- Workshop & Workfair calendar

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access an Workshop & Workfair calendar
Requirement	Use Case 4: User can view a degree planner generated for that user

Reference	
Steps of Test Case	● User selects the Career option ● User selects the Workshop & Workfair calendar option
Expected Outcome	● User can view a generated interactive calendar for Workshop & Workfair calendar

Amendment 6: Added module testing for Programming Guides

- Programming Guides

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Programming Guides page and be able to redirect back to Guides page .
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click “Some helpful Guides” ● From “Some helpful Guides” select one of the following ○ Programming Guides ● From Programming Guides user clicks on “Back to Guides”
Expected Outcome	Once a user successfully access Programming Guides link : ● The user should select from the displayed languages and expand the field box to obtain data from it ● Back to Guide should redirect user to Guides main page

Amendment 7: Added module testing for Possible interview questions

- Possible Interview Questions

Test Level	Module
Quality	Usability, Functionality

Criterion	
Description of Test	Users should be able to successfully access the Possible interview Questions page and be able to redirect back to Guides page .
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click “Some helpful Guides” ● From “Some helpful Guides” select the following ○ Possible Interview Questions ● From Possible interview Questions page user clicks on “Back to Guides”
Expected Outcome	Once a user successfully access Programming Guides link : ● The user should select from the displayed languages and expand the field box to obtain data from it ● Back to Guide should redirect user to Guides main page

Amendment 8: Add Job Success page to Module Level Testing

- Job Success page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Job Success page and be able to navigate information on the page.
Requirement Reference	Use case 14: User can access Job Success page and navigate through the page
Steps of Test Case	● Enter CSULB wiki main page ● Select Career card ● Click the following link ○ Job Success
Expected Outcome	After successfully accessing Job Success page: ● How to Succeed at your Job will display a list of current or past Employees/Employers blogs, work stories, or brief summary of what to expect at a computer science related field job/career.

	● Tips to be successful at your job.

Amendment 9: Add Conquering the Career Fair page to Module Level Testing

- Conquering the Career Fair page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Conquering the Career Fair page and be able to navigate the page.
Requirement Reference	Use case 14: User can access Conquering the Career Fair page and navigate through the page
Steps of Test Case	● Enter CSULB wiki main page ● Select Career card ● Click the following link ○ Conquering the Career Fair
Expected Outcome	After successfully accessing Job Success page: ● How to Conquer the Career Fair will display information on how to succeed at a career fair. This will help you become prepared for the fair, and have a better chance of obtaining an internship or gain better communication skills. ● Tips to be successful at your job.

Amendment 10: Add Minor in Cyber Security Applications page to Module Level Testing

- Cyber Security Applications minor page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Academics page and be able to navigate and should be able to view data and information regarding computer science related subjects.

Requirement Reference	Use case 15: User access Cybersecurity Applications page
Steps of Test Case	● Enter CSULB wiki main page ● Select Academics card ● Select Minor in Cyber Security Applications link
Expected Outcome	After successfully accessing Job Success page: ● The following page will be filled with information in regards to obtaining a Minor in Cybersecurity Applications. ● Will display all the requirements of the minor, the required courses, and all necessary information about the minor.

Amendment 11: Add Scheduling Classes page to Module Level Testing

- Scheduling Classes page

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Academics page and be able to navigate and should be able to view data and information regarding computer science related subjects.
Requirement Reference	Use case 15: User access Cybersecurity Applications page
Steps of Test Case	● Enter CSULB wiki main page ● Select Academics card ● Select Scheduling Classes link
Expected Outcome	After successfully accessing Job Success page: ● The following page will be filled with information in regards to scheduling your classes. . ● Will help students be able to schedule their classes per semester.

Amendment 12: Remove Unit Test: Login with Username and Password

- We decided to remove the account functionality from our web application

- Originally, account functionality was meant for CSULB administration to login and add or remove courses from the course explorer
- Now, the developers will manually update the course list as time goes on

Amendment 13: Modify View Course Descriptions on Unit Level Testing

View Course Descriptions

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access the list of CS courses offered at CSULB
Requirement Reference	Use Case 2: User can view prerequisites, descriptions, credits, course number
Steps of Test Case	● User selects the Course Explorer option from the Home page or Navigation bar ● View all courses, separated into the following categories: lower division, upper division, group 1 elective, group 2 elective, and both groups ● User selects desired course to view relevant course information
Expected Outcome	● User can find additional information about an individual CS course

Amendment 14: Modify Select a Course Description Card on Acceptance Level Testing

Compare multiple courses using course cards

Test Level	Acceptance
Quality Criterion	Functionality, Usability, Efficiency
Description of Test	User selects two different courses to display course cards for each of the two courses
Requirement Reference	Use Case 2: User can view prerequisites, descriptions, credits, course number

Steps of Test Case	- User selects the Course Explorer option from the Home page or Navigation bar - View all courses, separated into the following categories: lower division, upper division, group 1 elective, group 2 elective, and both groups - User selects desired course and verifies the first course card is displayed, with information on the first course - User selects course to compare to and verifies the second course card is displayed, with information on the second course - User selects any other course besides the first course and verifies the second course card displays the information regarding the selected card - User deselects the first course by clicking on the course button again and verifies that both cards are no longer displays
Expected Outcome	- Uses can view important information regarding multiple courses and compare two different courses at a time

Amendment 15: Replace Login on Acceptance Level Testing with Feedback

Feedback

Test Level	Acceptance
Quality Criterion	Functionality, Reliability, Usability, Security
Description of Test	User accesses the Feedback page to enter feedback into a submission box
Requirement Reference	Use case 16: User can provide feedback to the developers
Steps of Test Case	- Enter site and navigate to the Feedback page via the Footer or Sitemap - After user is redirected, verify a Google Forms submission box is displayed - User enters feedback into the box and submits response - Developers verify they can see the responses by checking the application email inbox
Expected Outcome	- Users can submit feedback on the web application and developers have access to their submissions

Amendment 16: Modify View Masters on Unit Level Testing

View Masters

Test Level	Unit
Quality Criterion	Usability
Description of Test	User is able to access the masters section of the web application to learn more about obtaining a post-bachelor’s degree in Computer Science at CSULB
Requirement Reference	Use case 18: User can access information regarding the Computer Science Masters program at CSULB
Steps of Test Case	● User selects the Academics option from either the navbar or the home page cards ● User selects the Graduate Program option from the Academics page ● A drop-down menu should be displayed, from which a user can select one of the menu options ● When a user selects an option, the page should expand and display the information regarding that subsection of the Masters program ● When a user deselects an option, the page should shrink and the information for that subsection should no longer be displayed
Expected Outcome	● User can gain access to the masters section of the web application

Amendment 17: Added module testing for Ways to study

- Ways to Study

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the Ways to study page and be able to redirect back to Guides page .
Requirement Reference	Use case 13: User can access Ways to study and see helpful tips

Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click “Some helpful Guides” ● From “Some helpful Guides” select the following ○ Ways to study ● From Ways to study user clicks on “Back to Guides”
Expected Outcome	Once a user successfully access Programming Guides link : ● The user should see a list of helpful tips regarding study time ● Back to Guide should redirect user to Guides main page

Amendment 18: Added module testing for Motivation

- For Motivation

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the For Motivation page and be able to redirect back to Guides page .
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click “Some helpful Guides” ● From “Some helpful Guides” select one of the following ○ For Motivation ● From Motivation user clicks on “Back to Guides”
Expected Outcome	Once a user successfully access For Motivation page : ● The user should select from videos displayed on the screen and is able to play and see that video ● Back to Guide should redirect user to Guides main page

Amendment 19: Added module testing for IDEs

- IDEs

Test Level	Module
Quality Criterion	Usability, Functionality
Description of Test	Users should be able to successfully access the IDEs and be able to redirect back to Guides page .
Requirement Reference	Use case 13: User can access Guides page and navigate between Buttons
Steps of Test Case	● Enter CSULB wiki main page ● Click “Get started” button ● Select Guides card ● Click “Some helpful Guides” ● From “Some helpful Guides” select one of the following ○ IDEs ● From IDEs user clicks on “Back to Guides”
Expected Outcome	Once a user successfully access IDEs link : ● The user should select from the displayed languages, user then can go to the respective IDE card to learn more about a particular IDE ● Back to Guide should redirect user to Guides main page

Amendment 20 : Added system testing for Website Responsiveness

Test Level	System
Quality Criterion	Usability
Description of Test	Check that pages load quickly, including cards on Course Explorer when courses are clicked on website
Requirement Reference	Most use cases
Steps of Test Case	● Go through all pages on the site map ● Click courses on the course explorer, noting the time it takes for the

	card(s) to appear or change
Expected Outcome	Pages will load in under 0.5 seconds with internet download speeds over 100 Mb/s. Cards will also appear or change in under 0.5 seconds after a course is clicked.