|  |  |  |  |
| --- | --- | --- | --- |
| **Qualification details** | | | |
| **Training Package Code and Title** | ICT - Information and Communications Technology (Version 8.0) | | |
| **Qualification National Code and Title** | ICT50220 Diploma of information Technology (Release 2) | **State code** | BGJ4 |
| **Assessment Title** *(as per DAP)* | Assessment Task One (Individual Project) | | |
| **Unit National Code & Title** | ICTWEB513 Build dynamic websites | | |
| ICTWEB514 Create dynamic web pages | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Date Due** | Week Five | | **Date Received** | |  | |
| **Student Name** |  | | | | | |
| **Student Declaration** | I declare that the evidence submitted is my own work: | | | | | |
| **Assessor Name** |  | | | | | |
| **Assessment Decision** | Satisfactory | | | Not Yet Satisfactory | | |
| **Assessor Signature** |  | | | **Date** | |  |
| **Is student eligible for reassessment (Re-sit)?** | No | Yes | | **Re-assessment Date:** | | Week Twenty |

|  |  |  |  |
| --- | --- | --- | --- |
| **Feedback to student** | | | |
| *Via Blackboard (LMS) – Please check [Grade] section.* | | | |
| **Feedback from student** | | | |
| *Via Blackboard (LMS) – Please use [Comment] section during submission.* | | | |
| **Student signature** |  | **Date** |  |

|  |  |
| --- | --- |
| **Assessment Instructions** | |
| **TO THE ASSESSOR** |  |
| Type of Assessment | Individual Project |
| Duration of the assessment | 5 class sessions (Weeks 1-5) |
| Location of assessment | Classroom |
| Conditions | Assessor to ensure that the noise levels, natural interactions and time variances are maintained as it would be in the Software Development industry.  Learners are required to complete the required tasks in class and submit the required documentation electronically via Blackboard |
| Elements and Criteria | As detailed in the assessment plan  You are required to make sure that all students meet the elements, performance criteria and oral communication items as outlined in the provided solution |
| **TO THE STUDENT** |  |
| Purpose of Assessment | You are required to show you can:  ICTWEB513 Build dynamic websites   * Demonstrate your skills and knowledge by creating, coding, debugging, and testing a dynamic website, * Establish user requirements and then research and collect information about business requirements and legislative standards, * Manage time and tasks to produce a hierarchy of web pages showing navigation.   ICTWEB514 Create dynamic web pages   * Review technical requirements for client-side dynamic content, * Apply applicable languages and technologies to develop templates for web site creation, * Test and evaluate the dynamic content and present feedback.   The student must demonstrate the ability to complete the tasks outlined in this assessment and is expected to use systematic analytical processes and effect time management to meet the goals/deadlines outlined in the DAP. |

|  |  |
| --- | --- |
| Allowable Materials | Blackboard Topics, SDLC, Weekly readings (PDF), Example programs and Independent Outside of Class Activities |
| Required Resources | Web links and example code can be downloaded from the Blackboard portal.  PC with Notepad++, Turnkey Web Server, GitHub, MSOffice.  Internet Access to GitHub and www.citems.com.au/ |
| Reasonable Adjustment | In some circumstances, adjustments to assessments may be made for you. If you require support for literacy and numeracy issues; support for hearing, sight or mobility issues; change to assessment times/venues; use of special or adaptive technology; considerations relating to age, gender and cultural beliefs; format of assessment materials; or presence of a scribe you need to inform your lecturer. |
| Assessment Submission | All questions and programming activities must be attempted. All written answers must be submitted in this assessment document in the appropriate space.  Use of research tools and peers in formulating answers are acceptable – but work submitted must be your own work.  Final project documentation is to be uploaded to the appropriate area in the Blackboard course created for this unit.  If you are marked as NYS (Not Yet Satisfactory) on your first attempt, you will be provided with another opportunity to re-attempt the assessment. |
| Portfolio Description | A project of web coding tasks and written questions which should be completed in class and finished in the students’ own time on a weekly basis as per the Delivery and Assessment schedule.  Question 1 – Design Specifications  Question 2 – Web Page Content  Question 3 – Version Control  Question 4 – Design Approval  Question 5 – Website Development  Question 6 – Testing  Question 7 – Demonstration, Feedback and Signoff |

# Scenario

You have applied for the role of a Senior Web Programmer with CITE Managed Services, as part of the application process you are required to demonstrate your knowledge and skills by creating a multi-page website. The details and criteria are provided in the following paragraphs.

The multi-page website will utilise the Bootstrap framework for navigation and display information as requested. Ensure your development follows an Agile methodology that is recorded and maintained using your GitHub account.

You should consult with the CITE representative (your Lecturer) if you are unsure about any of the problems or questions in this assessment. Your primary research should focus on the resources on the Blackboard LMS and CITE web site, additional information can be collected from the Internet, ensure all sources are referenced in your submission. You must demonstrate your working website before uploading to Blackboard, your Lecturer (Assessor) will sign off to ensure all the criteria are satisfied.

## Minimum Client Requirements

* A single home web page (index.html) as the entry point into the website.
* A single contact web page (contact.html) with links to the CITE and SMTAFE websites.
* The user can navigate between all web pages using a suitably labelled navigation system.
* Navigation can be vertical/horizontal or tabbed using the appropriate Bootstrap framework.
* The navigation must be consistent across all web pages. All web pages must have a consistent theme (colours, fonts, etc)
* The user can select/click an item on the content web pages and the appropriate answer/definition will be displayed.
* The content display must be accordion or collapse; any variation must be approved by the Lecturer before implementation.
* The website must be compatible with all contemporary web browsers.
* The website must be compatible with all major devices (PC, Mobile).
* The website must be WCAG compliant where appropriate.
* The development must fully utilise all aspects of the Bootstrap framework version 5; visit the Bootstrap URL to review and select the appropriate components, https://getbootstrap.com.

## Suggested Interface Design

|  |  |  |
| --- | --- | --- |
| Graphical user interface, application  Description automatically generated | Graphical user interface, text, application, email  Description automatically generated | Graphical user interface, text, application, Word  Description automatically generated |
| Home Page | Content (accordion layout) | Content (collapse layout) |

## Question 1 Design Specification

Provide a suitable description/explanation for each client requirement, and then insert your GUI design with labels that highlight all the major features. Complete the following Design Specification template to answer this question.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Design Specification | | | | |
| Developer Name | Atit Singh | | Date | 05/08/2022 |
| Technical Requirements | | | | |
| Requirement | | Description | | |
| 1. What is the purpose of the Website? | | The purpose of the website it to show the question and answers related to the website development. | | |
| 2. Functionality: How will a user navigation the website and access the content? | | The website will have the Menu on the top of the page align horizontally. The user can access the content on each click of the menu. The answer is hidden within the question, will display when the user clicks on Answer button. | | |
| 3. Cross Platform: How will the website display on various OS and Device? | | For Desktop computer all the menus and icon are displayed in the webpage whereas in mobile device the web site will only shows the main menu and most of the icon will either disappear or adjust according to the screen size. | | |
| 4. Libraries and Frameworks: What web technologies will be used in the website? | | For the project, html, CSS and Bootstrap is used for the development. | | |
|  | |  | | |
| Prototype Specification (GUI Design Diagram and Navigation Diagram) | | | | |
|  | | | | |

## Question 2 Web Page Content

Your next task is to create the content for each of the web pages on your website. You are required to research and provide suitable answers for the following groups of questions/definitions. Each group of questions/definitions must be displayed on a separate web page using a similar page layout as shown in your design.

### **Content Questions (group one)**

### **What are the principles of analysis and design?**

Analysis focuses on looking into the problem and what needs to be done rather than coming up with a solution. For instance, how will a new computerised library information system be used? "Analysis" is a broad word that is best defined, like "requirements analysis," which is a look into what is needed, or "object analysis," which is a look at what is there (an investigation of the domain objects).

Design focuses on a conceptual solution that meets the needs rather than how it will be put into action. For instance, a description of a database schema and software objects. In the end, designs can be put into action.

As with analysis, the term is best used with a qualifier, such as "design of an object" or "design of a database."

https://www.oreilly.com/library/view/applying-uml-and/0130925691/0130925691\_ch01lev1sec3.html

### **What is website architectural requirements?**

The website architecture requirements are as follows:

* Consideration of technical limitations such as server, the storage, the memory, and the interfaces for communication.
* Functional features such as the services or operations that the website will offer.
* Visual appearance, which includes the user interface, colours, buttons, and other elements of visual design.
* Security parameters, which describe how the website will enable secure access control and transactions.

https://www.techopedia.com/definition/30409/website-architecture

### **What are website design structures, including hierarchy and navigation design?**

Hierarchical model: One of the most prevalent styles of site architecture is the hierarchical model. The hierarchical architecture is frequently utilised in online applications with a huge amount of data. The hierarchical architecture, like a tree, has a trunk (like a homepage) that branches out into categories and pages. CNN.com and BBC.co.uk are excellent examples of hierarchical models.

Sequential model: Sequential models are often used to walk users through a process step by step, like when they are being onboarded or when they are making a new account. This model can be used by UX designers to make flows for a process. Each page on wikiHow.com is a good example of a page that was made with order in mind.

Matrix model: One of the oldest types of site structure on the internet is the matrix model. This model is different and doesn't act like other models. A structure that looks like a matrix lets users choose where they want to go next. The best way to get around these kinds of sites is to use search or internal links. The matrix model is shown very well by Wikipedia.

Database model: A database model is a way to structure a website that changes over time. To build a website structure like this, designers should think about the bottom-up method, which involves looking at a page's metadata and following best practises for information architecture and taxonomy. Medium.com is a great example of a database model because of its posts and pages.

https://xd.adobe.com/ideas/process/information-architecture/different-types-of-website-structures/

### **What is user-interface design requirements and production processes?**

The user interface must be safe, easy to use, and able to grow. Security requirements include keeping authorisation information safe from people who shouldn't be able to see it, keeping customer information private, and keeping track of payments in progress. It is also important to make sure that each party is safe from fraud. The user interface should be quick to use and easy to understand.

https://www.w3.org/ECommerce/interface.html

### **Content Questions (group two)**

### **What are programming controls and design structures?**

Control Structures define programme flow. Logic or control structures make any algorithm or programme clearer and more understandable. It evaluates programme parameters and situations to determine programme flow. There are three basic types of logic, or flow of control, known as:

* Sequence logic, or sequential flow
* Selection logic, or conditional flow
* Iteration logic, or repetitive flow

Design process is called structured design. An algorithm can be developed using simple design concepts, pseudo-code, and flowcharts.

* Sequence, which implies executing blocks of instructions in order
* Selection, also called alternation or conditional branch; the algorithm must choose one of the alternate paths
* Repetition, also called loops, is a set (or block) of instructions that are executed zero, one, or more times
* Input-output meaning variable values are taken from an input device (keyword) or output device (results) (screen)

Blackboard > Cluster - Agile Web Development > Learning content > topic 1 > 8. Programming\_Design\_Structure

### **What are website testing procedures?**

Functionality Testing: Test for – all the links in web pages, database connections, forms used for submitting or getting information from the user in the web pages, Cookie testing, etc.

Usability Testing: Usability testing is the process of measuring a system's human-computer interaction features and identifying flaws for remedy. Usability Testing includes the following:

* The website should be easy to use.
* The instructions provided should be very clear.
* Check if the instructions provided are perfect to satisfy its purpose.
* The main menu should be provided on each page.
* It should be consistent enough.

Interface Testing: The server-side interface should be tested when testing a website. You can do this by making sure the communication is done right. It should be made sure that the server works with the software, hardware, network, and database.

The main interfaces are:

* Web/app server interface
* Application server/Database server interface.
* Check all server interactions and error handling. If the database or web server provides an error message for an application server query, the application server should catch and display it.
* Check what happens if a transaction is interrupted. What happens if the webserver connection is reset?

Compatibility Testing: testing is done to test whether it is compatible with all the browsers, operating system, devices, and printing options.

Performance Testing: The web application should sustain a heavy load. Web performance testing should include Web Load Testing and Web Stress Testing.

Security Testing: The final level of web application testing protects your app from unwanted access and viruses. Web application security testing includes several steps:

* Test unauthorised access to secure pages
* Ensure active sessions are ended after user inactivity
* Verify the application's SSL
* Ensure restricted content cannot be downloaded without authorisation

https://www.softwaretestinghelp.com/web-application-testing/

### **What is website debugging methods?**

**Firefox Developer Tools**: Firefox Developer Tools is a powerful set of tools for examining, exploring, and debugging webpages. This lets you examine and edit HTML and CSS. Its built-in JavaScript debugger lets you stop, step through, study, and alter executing JavaScript.

Chrome Developer Tools: Google Chrome includes Chrome Developer Tools for web developers. It edits pages and fixes coding mistakes. "DevTools for beginners" teaches web development basics. View and adjust page styles, troubleshoot JavaScript, and optimise website speed with this tool.

**Web Developer:** Web Developer adds a toolbar with debugging and examining web page options to Firefox and other browsers. This tool helps with big CSS files and unfamiliar tasks. It contains a built-in feature to validate page syntax and find mistakes.

**Safari Developer Tools:** Safari Developer Tools ensures website compatibility with major browsers. Safari includes Web Inspector, a powerful tool for editing, debugging, and optimising websites for performance and compatibility. Its responsive design feature previews web pages for different screen sizes, orientations, and resolutions.

**Internet Explorer Web Edge (Developer) Toolbar:** Internet Explorer Web Edge Developer Toolbar is like Firebug. This application lets you edit DOM and HTML in the browser. It enables you change and edit DOM components to monitor predetermined actions or code changes. The IE Web Developer Toolbar can test and debug JavaScript.

### **What are website coding techniques?**

# Learning HTML: HTML is an easy-to-learn coding language. HTML defines website front-end content structure.HTML is used to construct headings, links, and paragraphs. Each HTML element has an opening tag, a closing tag, and content.

Help With an Open-Source Project: Joining an open-source project can help you master coding techniques. These projects don't require you to accomplish more than you want. If you challenge yourself, these possibilities are a terrific way to learn code and concepts. Fixing issues or helping finish a project can be a great learning experience.

Learning CSS: CSS, or Cascading Style Sheets, comes after HTML. CSS describes how HTML components are rendered. It specifies page layouts, colours, and fonts. HTML and CSS give websites style. Your website is like a house. HTML is your living room's drywall while CSS is the purple paint.

Optimize All Your Images: Compressing and optimising photos might boost your website's performance. A slow website can lose customers. Free and paid programmes make it easy to compress photos, so they load faster in browsers.

Test Your Site as You Build It: Coding can be difficult enough without having to deal with a bunch of extra problems when you're trying to finish up a project. To avoid being bombarded by a bunch of bugs, it's a good habit to test your site on multiple browsers as you build it.

https://www.sectorlink.com/article/website-tips-and-coding-techniques-for-the-modern-web-developer

### **Content Definitions (group three)**

**Authentication and web security**: A server uses authentication when it needs to know who is accessing their information or site. When a client wants to know that the server is the system it purports to be, it uses authentication. The user or machine must confirm its identity to the server or client during authentication.

A web proxy between users and the Internet enforces web security. This appliance can be on-premises, cloud-based, or web-browser-based. All that counts is that an employee's PC sends all Internet-bound traffic through web security.

Between a web user and the Internet, the web security solution has extensive visibility and control over web traffic. All application-layer communication can be examined for harmful content or policy violations. Approved traffic can continue, while other traffic is dropped.

https://www.mimecast.com/content/web-security/

**Hypertext transfer protocol (HTTP):** HTTP is a set of rules for sending files like text, images, sounds, videos, and other multimedia files over the web. When a person opens their web browser, they are using HTTP in an indirect way. HTTP is an application protocol that runs on top of the TCP/IP suite of protocols, which are the basis of the internet. HTTP/2 is the most recent version of HTTP. It came out in May 2015. It is an alternative to HTTP 1.1, but it does not make HTTP 1.1 useless.

https://www.techtarget.com/whatis/definition/HTTP-Hypertext-Transfer-Protocol

**Session management**: Session management is used to make sure that a user's interactions with a service or application are safe. It is used to handle a user's requests and responses in a certain order. When a user has an open session with a web application, they send requests during that session, and they often send information that could be sensitive. The application may save this information and/or keep track of the user's status across all requests during the session. More importantly, the application must have a way to keep private information about each user safe, especially during authenticated sessions.

https://www.packetlabs.net/posts/session-management/

### **Stateless programming:** A stateless programming is a software that doesn't save client data made in one session so that it can be used in the next session with the same client. Each session is run as if it were the first, and answers don't depend on what happened in a previous session. A stateful application, on the other hand, remembers information about each client session and uses that information the next time the client makes a request.

https://www.techtarget.com/whatis/definition/stateless-app

### Content Definitions (group four)

### **The three major programming control structures.**

* Sequence Control structure: This refers to the line-by-line execution, in which statements are executed sequentially, in the same order in which they appear in the script. They might, for example, carry out a series of read or write operations, arithmetic operations, or assignments to variables.
* Design control structure: Depending on whether a condition is true or false, the decision control structure may skip the execution of an entire block of statements or even execute one block of statements instead of another.
* Loop control structure: this is a control structure that allows the execution of a block of statements multiple times until a specified condition is met.

### **Hypertext markup language (HTML) and markup languages:** Hypertext Markup Language (HTML) is a set of symbols or codes that are used to mark up a file that will be shown on the Internet. The markup tells web browsers how to show the words and pictures on a web page.

### Each piece of markup code that goes between "<" and ">" is called an element, though many people also call it a tag. Some elements come in pairs that show when an effect on the screen should start and when it should stop.

https://www.investopedia.com/terms/h/html.asp

### **Cascading style sheets (CSS):** CSS is a stylesheet language that is used to describe how a document written in HTML or XML should look (including XML dialects such as SVG, MathML or XHTML). CSS tells how elements should look on a screen, in print, when spoken, or in any other medium.

### CSS is one of the most important languages on the open web, and all Web browsers use the same rules for it. Before, different parts of the CSS specification were made at the same time, which made it easy to keep track of the latest recommendations. You may have heard of CSS1, CSS2.1, or even CSS3. There will never be a CSS3 or a CSS4. Instead, everything is now just CSS without a version number.

https://developer.mozilla.org/en-US/docs/Web/CSS

### **Syntax and uses of programming languages**: Syntax means the rules that show how a language is put together. In computer programming, syntax is the rules for how the symbols, punctuation, and words of a programming language are put together. Without syntax, it's hard to figure out what a language means or how it works.

### A programming language is an artificial language used to operate machines, especially computers. Programming languages utilise syntactic and semantic rules to define structure and meaning.

### Programming languages are used to express algorithms and organise and manipulate data. Some authors limit "programming language" to those that can express all algorithms; "computer language" is frequently used for more limited artificial languages.

https://woz-u.com/blog/what-is-syntax-in-computer-programming/#:~:text=Syntax%20refers%20to%20the%20rules,is%20nearly%20impossible%20to%20understand.

## Question 3 Version Control

CITE would like you to use GitHub as the primary source control, setup an appropriate structure in your GitHub account to manage the Assessment One website development. Add a project to your repository which reflects the basic Agile development process you intend to pursue. Complete the following GitHub Version Control template to answer this question.

|  |  |  |  |
| --- | --- | --- | --- |
| GitHub Version Control | | | |
| Repository Name: |  | | |
| URL |  | Date |  |
| Screen Shot(s) |  | | |

## Question 4 Design Approval

Once you have complete questions 1,2 & 3 arrange for your document to be reviewed by the Lecturer/Assessor for approval, sign off and feedback before completing the development and testing.

* Question 1 Design Specification
* Question 2 Web Page Content
* Question 3 Version Control

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Design Approval (Lecturer/Assessor use only) | | | | |
| Approver Name | Title | Signature | Date | Approved? |
| Ken Beck | Lecturer |  | 19/08/2022 | Yes |
|  |  |  |  |  |
| Lecturer Feedback | | | | |
|  | | | | |

## Question 5 Website Development

Develop the software components to create a website based on your prototype and design specifications. Add the content from Question 2 and enhance the fonts and background colours to satisfy contemporary web page standards. Upload your code to the Turnkey Server. Update your GitHub with the completed website code and associated files. Your code must adhere to the CITEMS software development standards. (refer http://www.citems.com.au/)

## Question 6 Testing

Ensure your code is error free and functions correctly, then test the website on several different browsers. During these tests check the web pages scale correctly and conforms to responsive web design. Secondly, test the website on several different digital devices and record any errors. Your Test Report must include appropriate evidence that your code functions as expected (references to screen captures). Complete the following Test Report template below to answer this question.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Report | | | | |
| Developer Name | Atit singh | **Date** | 01/09/2022 | |
| Browser compatibility test | | | | |
| Browser name | Description | | | Pass / Fail |
| Google Chrome | All Website is displayed as per according to the requirement | | | Pass |
| Microsoft Edge | All Website is displayed as per according to the requirement | | | Pass |
| Mozilla Firefox | All Website is displayed as per according to the requirement | | | Pass |
|  |  | | |  |
|  |  | | |  |
| Device compatibility test | | | | |
| Device Name | Description | | | Pass / Fail |
| Desktop | Website is displayed in a full screen with all the navigation and menus | | | Pass |
| Samsung Galaxy s20 | Navigation menus align vertical, and content adjust with the screen size | | | Pass |
| iPhone 12 pro | Navigation menus align vertical, and content adjust with the screen size | | | Pass |
|  |  | | |  |
|  |  | | |  |

## Question 7 Demonstration, Feedback and Signoff

Ensure your code is fully commented with your Name, ID, and Date placed above the main code body of each file. Check all the above documentation has been completed and is ready for inspection. Contact your Lecturer (Assessor) and arrange to demonstrate your working website, use the following Marking Guide and Observation Checklist to ensure you have completed all the assessment criteria.

### Assessor Marking Guide

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Marking Guide and Observation Checklist | | Satisfactory | | Feedback |
| **Questions** | | YES NO | |  |
| Q1 | Design Specifications: All fields of the Design Specification are filled in. |  |  |  |
|  | Client Requirements contain information that is correct. |  |  |  |
|  | Prototype Specifications show a detailed diagram of the GUI with explanation notes. |  |  |  |
| Q2 | Web Page Content: All the questions and definitions have been grouped and formatted onto separate pages. |  |  |  |
|  | Questions are formatted for easy access. Code uses Bootstrap 5 framework. |  |  |  |
|  | Definitions are formatted for easy access. Code uses Bootstrap 5 framework. |  |  |  |
| Q3 | Version Control: All fields of the template are filled in. There are screen shots of GitHub showing the Project and Repository. |  |  |  |
|  | Observation of GitHub reflects an Agile project methodology. |  |  |  |
|  | Observation of GitHub reflects a repository with website files. |  |  |  |
| Q4 | Website Development: All the website files have suitable comments which reflect CITE standards. |  |  |  |
|  | Observation of GitHub shows a final version of the website files. |  |  |  |
|  | Website has satisfied all the client requirements. |  |  |  |
| Q5 | Testing: All the fields in the Testing Report have been filled in. |  |  |  |
|  | Website have been tested on three different browsers. |  |  |  |
|  | Website have been tested on three different digital devices. |  |  |  |
| Q6 | Demonstration: The website functions as required, and all web components work correctly. |  |  |  |
| **General Feedback:** | | | | |
|  | **Assessment Decision**  Satisfactory  Not Yet Satisfactory | | | |

**Note:** All documentation must use the supplied templates/forms.

**Submit the zipped solution folder with relevant documents to Blackboard**

End of Assessment Task One