

SWDJF301

JAVASCRIPT FUNDAMENTALS

APPLY JAVASCRIPT

Competence

RQF Level: 3

Learning Hours

Credits: 10



Sector: ICT AND MULTIMEDIA

Trade: SOFTWARE DEVELOPMENT

Module Type: Specific

Curriculum: TVET Certificate III in Software Development

Copyright: © Rwanda TVET Board, 2022

Issue Date: June, 2022

1200

Purpose statement	This specific module describes the skills required to develop dynamic websites using JavaScript.					
	Upon completion of this module, the learner will be able to; Apply JavaScript Basic Concepts, manipulate data with JavaScript and Apply JAVASCRIPT in a web Project.					
Delivery modality	Training delivery		100%	Assessment		Total 100%
	Theoretical content		30%	Formative asses	30%	50%
	Practical work:		70%		70%	
	<ul style="list-style-type: none">Group project and presentation	20%				
	<ul style="list-style-type: none">Individual project /Work	50%				
			Summative/Integrated Assessment			50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Apply Javascript Basic Concepts	1.1 Javascript is properly integrated in HTML based on project structure
	1.2 Variables are correctly used based on task
	1.3 Datatype are correctly used based on variables
	1.4 Operators are correctly used based on task
2. Manipulate data with Javascript	2.1 Conditional statements are properly implemented according to the control flow
	2.2 Loop functions are appropriately used based on task
	2.3 Functions are appropriately used based on the task
	2.4 Object are correctly defined based on task

	2.5 Arrays are appropriately applied based on task
	2.6 String concatenation is correctly done based on task
	2.7 HTML Events are well applied based on event occurred on inputs or buttons
	2.8 Regular expressions are appropriately used based on task
	2.9 Errors are properly caught and handled based on Javascript error handling mechanism
3. Apply javascript in Project	3.1 Project environment is well prepared according to work to be done
	3.2 HTML pages are well created based on project
	3.3 CSS files are well created and manipulated with HTML pages
	3.4 Javascript functions are well applied according to project requirements

Course content

Learning outcomes	<p>At the end of this module learner will be able to:</p> <ol style="list-style-type: none"> 1. Apply Javascript Basic Concepts, 2. Manipulate data with JavaScript 3. Apply JAVASCRIPT in a web project.
Learning outcome 1: Apply JavaScript Basic Concepts	Learning hours: 20
Indicative content	
<ul style="list-style-type: none"> ● Introduction to Javascript <ul style="list-style-type: none"> ✓ Definition of JAVASCRIPT ✓ Application of Javascript ✓ Install VSCode & node ✓ JAVASCRIPT key concepts <ul style="list-style-type: none"> ● Variable ● Data Types ● Values ● Operators ● Expressions ● Keywords ● Comments ✓ Javascript libraries <ul style="list-style-type: none"> ● React Javascript ● JQuery ● Three Javascript ✓ Javascript frameworks <ul style="list-style-type: none"> ● Vue Javascript ● Angular Javascript 	

- Express Javascript
- ✓ Javascript runtime environment
 - Node Javascript
 - v8 Engine
- ✓ Javascript versions
- **Integration of Javascript to HTML**
 - Referencing HTML to Javascript
 - ✓ Using <script> tag
 - Javascript in <head>
 - Javascript in <body>
 - ✓ **using external Javascript**
 - ✓ using external Javascript reference (CDN)
 - ✓ Javascript output
- **Use of variables in JAVASCRIPT**
 - ✓ Declaration of variable
 - Naming conversion
 - Variable initialisation
 - ✓ Re-declaration of variable
- **use of data types in JAVASCRIPT**
 - ✓ Primitive Data Types
 - ✓ Non-primitive/reference data types
 - ✓ Type-casting
- **Use of operators in Javascript**
 - ✓ Assignment operators
 - ✓ Arithmetic operators
 - ✓ String operator
 - ✓ Comparison operators
 - ✓ Logical operators
 - ✓ Bitwise operators
 - ✓ Ternary operator

Resources required for the learning outcome

Equipment

- Computer
- projector
- White board

Materials	<ul style="list-style-type: none"> • Internet • Electricity • Flipchart • Marker pen
Tools	<ul style="list-style-type: none"> • VScode • Node • Notepad++ • Sublime
Facilitation techniques	<ul style="list-style-type: none"> • Brainstorming, • Group Discussion, • Jig Saw • Demonstration Visual Aids
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Performance • Oral assessment

Indicative content

- **Using string in Javascript**
 - ✓ String declaration
 - ✓ Escape characters
 - ✓ String concatenation
 - ✓ String methods
 - ✓ String search method
 - ✓ String Template literals
- **Using conditional statement**
 - ✓ If statement
 - ✓ conditional (ternary) operator
 - ✓ Switch
- **Using Loop functions in Javascript**
 - ✓ For loop
 - ✓ For/In Loop
 - ✓ For/of loop
 - ✓ while loop
 - ✓ do / while loop
- **Using Functions in Javascript [Practical]**
 - ✓ Function Definition
 - ✓ Function parameters
 - ✓ Arrow functions
 - ✓ Built-in functions
 - ✓ Function call
 - ✓ Function apply
 - ✓ Function bind
 - ✓ Function closure
 - ✓ Asynchronous functions
 - ✓ promise functions
 - ✓ Async/await function
- **Using objects in Javascript**
 - ✓ Definition

- ✓ Syntax
- ✓ Accessing object method and properties
- ✓ Object constructors
- ✓ Object sets
- ✓ Object maps

- **Using arrays in Javascript**

- ✓ Syntax
- ✓ Types
- ✓ Methods
- ✓ Arrays iterations

- **Using Javascript in HTML**

- ✓ HTML events
- ✓ Javascript HTML event listener
- ✓ Window Object

- Properties

- console
 - document

- innerHeight

- innerWidth
 - length
 - localStorage
 - location

- Methods

- alert()
 - setInterval()
 - clearInterval()
 - setTimeout()
 - clearTimeout()
 - open()
 - confirm()
 - close()
 - stop()
 - print()

- ✓ Javascript form validation

- ✓ Apply Canvas

- Introduction
 - Drawing
 - Coordinates
 - Gradients
 - Text
 - Image

- ✓ Javascript HTML DOM

- innerHTML

- getElementById
- getElementsByClassName
- getElementsByName
- getElementsByTagName
- querySelector
- querySelectorAll
- ✓ Javascript HTML styles
 - Animation
 - Transition
 - Slide show
- **Applying regular expression**
 - ✓ Modifiers
 - ✓ Groups
 - ✓ Metacharacters
 - ✓ Quantifiers
- **Error handling**
 - ✓ Types of error
 - ✓ Try & catch
 - ✓ Throw

Resources required for the learning outcome

Equipment	<ul style="list-style-type: none"> • Computer • projector • White board
Materials	<ul style="list-style-type: none"> • Internet • Electricity • Flipchart • Marker pen
Tools	<ul style="list-style-type: none"> • Vscod • Node • Notepad++ • Sublime
Facilitation techniques	<ul style="list-style-type: none"> • Brainstorming, • Group Discussion, • Jig Saw • Demonstration Visual Aids

Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Performance • Oral assessment
-------------------------------------	--

Learning outcome 3: Apply JavaScript in Project	Learning hours: 30
Indicative content	
<ul style="list-style-type: none"> • Preparing project environment <ul style="list-style-type: none"> ✓ create project folder ✓ folders and files structuring • Create pages with HTML <ul style="list-style-type: none"> ✓ Tables ✓ Form • Apply CSS to HTML pages <ul style="list-style-type: none"> ✓ Inline css ✓ Internal css ✓ External css ✓ Imported css • Apply Javascript <ul style="list-style-type: none"> ✓ Variables ✓ Operators ✓ Conditional statements ✓ Looping statements ✓ Functions ✓ Objects 	

Resources required for the learning outcome
--

Equipment	<ul style="list-style-type: none"> • Computer • projector
Materials	<ul style="list-style-type: none"> • Internet • Electricity
Tools	<ul style="list-style-type: none"> • Vscod • Node • Notepad++ • Sublime
Facilitation techniques	<ul style="list-style-type: none"> • Brainstorming, • Group Discussion, • Jig Saw • Demonstration Visual Aids
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Performance

Integrated/Summative assessment

Integrated Situation

XYZ Company is a forex bureau located in Rubavu District, they exchange money from one currency to another with cash.

In that company, they use a manual calculator in exchanging currencies.

They want to have an online web calculator project for currency exchange. This platform will be able to convert amounts from one currency to another.

They hired a UI/UX Designer to design a mockup for the project, that mockup is provided below.

MacBook Pro 14" - 1

XYZ-COMPANY
CURRENCY EXCHANGE PLATFORM

Amount: 100 From: USD - \$ To: Rwanda - RWF

Convert Result: 10 300

XYZ Company hired you as a frontend developer to develop the platform above by using HTML,CSS and JavaScript.

The work must be performed within six hours (6).

Resources

Tools	<ul style="list-style-type: none"> • Vscode • NodeJs • Notepad++
Equipment	<ul style="list-style-type: none"> • Computer
Materials/ Consumables	<ul style="list-style-type: none"> • Internet • Electricity • Papers

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
1. Apply Javascript Basic Concepts 35%	1. Javascript is properly integrated in HTML based on project structure	Indicator 1. VS Code is installed			3
		Indicator 2. HTML structure are created			4
		Indicator 3.			4

		Convert button is created			
		Indicator 4. Input Text are formatted			4
		Indicator 5. HTML event listener are applied (onclick)			4
		Indicator 6. Window object methods And Properties are used			4
		Indicator 8. Javascript form is validated			8
	2. Variables are correctly used based on task	Indicator 1. Variable initialisation is applied			3
		Indicator 2. Variables are declared			3
	3. Datatype are correctly used based on variables	Indicator 1. Datatypes are applied			5
		Indicator 2. Type casting is applied			3
	4. Operators are correctly used based on task	Indicator 1. Assignment operators are used			3
		Indicator 2. Arithmetic operators are used			4
		Indicator 3. Comparison /Ternary operators are applied			4

2. Manipulate data with Javascript 35%	1. Conditional statements are properly implemented according to the control flow	Indicator 1. If else / Switch case statement is used			6
	3. Functions are appropriately used based on the task	Indicator 1.Built-in functions are used			4
		Indicator 2.Function call is respected			4
	9. Errors are properly caught and handled based on Javascript error handling mechanism	Indicator 1.Try and catch is respected			4
		Indicator 2.Errors are caught and handled			6
Apply Javascript in Project 30%	1. Project environment is well prepared according to work to be done	Indicator 1.Project folder is created			4
		Indicator 2.Folder and files structure is respected			4
	2. CSS files are well created and manipulated with HTML pages	Indicator 1.Colors are used			5
		Indicator 2.Alignment is respected			5
		Indicator 3 Borders are formatted			4
Total marks		100			
Percentage Weightage		100%			
Minimum Passing line % (Aggregate): 70%					

References:

1. Smith, J. (Year). Exploring JavaScript: A Primer on Basic Concepts. Programming Journal, volume(issue), page numbers.
2. Johnson, A. (Year). Data Manipulation Techniques in JavaScript: Hands-On Examples. Web Development Quarterly, volume(issue), page numbers.
3. Williams, R. (Year). JavaScript in Real-world Projects: Best Practices and Case Studies. Software Development Journal, volume(issue), page numbers.
4. (2022, June 22). <https://kinsta.com/blog/javascript-libraries/>
5. (2022, June 22). https://www.w3schools.com/Javascript/Javascript_where_to.asp
6. (2022, June 23). https://www.w3schools.com/Javascript/Javascript_variables.asp
7. (2022, June 26). https://www.w3schools.com/js/js_datatypes.asp
8. (2022, June 24) https://www.tutorialspoint.com/javascript/javascript_error_handling.htm
9. (2022, June 26). https://www.w3schools.com/js/js_functions.asp
10. (2022, June 26). https://www.w3schools.com/js/js_events.asp
11. (2022, June 26). <https://www.programiz.com/javascript>
12. (2022, June 26). <https://www.javatpoint.com/javascript-calculator>
13. (2022, June 26). <https://www.interviewbit.com/blog/javascript-projects/>