WEB DESIGN AND DEVELOPMENT STANDARDS

This document was prepared by:

Office of Career Readiness, Adult Learning & Education Options
Nevada Department of Education
755 N. Roop Street, Suite 201
Carson City, NV 89701

www.doe.nv.gov

Draft for review by the Nevada State Board of Education on
June 04, 2020

NEVADA STATE BOARD OF EDUCATION

Elaine Wynn...President
Mark Newburn ....Vice President
Robert Blakely ....Member
Katherine Dockweiler...Member
Tamara Hudson ....Member
Cathy McAdoo..Member
Kevin Melcher...Member
Dawn Miller ....Member
Felicia Ortiz..Member
Teri White...Member
Rui Ya Wang .... Student Representative

NEVADA DEPARTMENT OF EDUCATION

Jhone M. Ebert
Superintendent of Public Instruction

Craig Statucki, Director
Office of Career Readiness, Adult Learning & Education Options

VISION

All Nevadans ready for success in the 21st century

MISSION

To improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The development of Nevada career and technical standards and assessments is a collaborative effort sponsored by the Office of Career Readiness, Adult Learning & Education Options at the Department of Education and the Career and Technical Education Consortium of States. The Department of Education relies on teachers and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. Most important, however, is recognition of the time, expertise and great diligence provided by the writing team members in developing the career and technical standards for Web Design and Development.

STANDARDS DEVELOPMENT MEMBERS

Brian Bolton	Teacher	Reno High School, Reno
David Brodersen	Faculty	College of Southern Nevada, Las Vegas
Michele Coultas	Teacher	Palo Verde High School, Las Vegas
Kenny Eliason	Industry	Neon Brand, Las Vegas
Monique Gaudin	Industry	Enigma2Eleven Productions, Las Vegas
Landon Hughes	Teacher	Virgin Valley High School, Mesquite
Sherri Kelley	Teacher	Carson High School, Carson City
Mahima Pandey	Faculty	College of Southern Nevada
Kate Pulling	faculty	College of Southern Nevada, Las Vegas
Kathy Schwandt	Faculty	Great Basin College, Elko
Denise Snow	Teacher	Southwest CTA, Las Vegas

BUSINESS AND INDUSTRY VALIDATION

All CTE standards developed through the Nevada Department of Education are validated by business and industry through one or more of the following processes: (1) the standards are developed by a team consisting of business and industry representatives; or (2) a separate review panel was coordinated with industry experts to ensure the standards include the proper content; or (3) the adoption of nationally-recognized standards endorsed by business and industry.

The Web Design and Development standards were validated through active participation of business and industry representatives on the development team.

PROJECT COORDINATOR

Melissa Scott, Assistant Director
Information and Media Technologies
Office of Career Readiness, Adult Learning & Education Options
Nevada Department of Education

INTRODUCTION

The standards in this document are designed to clearly state what the student should know and be able to do upon completion of an advanced high school Web Design and Development program. These standards are designed for a three-credit course sequence that prepares the student for a technical assessment directly aligned to the standards.

These exit-level standards are designed for the student to complete all standards through their completion of a program of study. These standards are intended to guide curriculum objectives for a program of study.

The standards are organized as follows:

Content Standards are general statements that identify major areas of knowledge, understanding, and the skills students are expected to learn in key subject and career areas by the end of the program.

Performance Standards follow each content standard. Performance standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

Performance Indicators are very specific criteria statements for determining whether a student meets the performance standard. Performance indicators may also be used as learning outcomes, which teachers can identify as they plan their program learning objectives.

The crosswalk and alignment section of the document shows where the performance indicators support the Nevada Academic Content Standards. Where correlation with an academic content standard exists, students in the Web Design and Development program perform learning activities that support, either directly or indirectly, achievement of the academic content standards that are listed.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to the Web Design and Development program. CTSOs are co-curricular national organizations that directly reinforce learning in the CTE classroom through curriculum resources, competitive events, and leadership development. CTSOs provide students the ability to apply academic and technical knowledge, develop communication and teamwork skills, and cultivate leadership skills to ensure college and career readiness.

The Employability Skills for Career Readiness identify the "soft skills" needed to be successful in all careers and must be taught as an integrated component of all CTE course sequences. These standards are available in a separate document.

The **Standards Reference Code** is only used to identify or align performance indicators listed in the standards to daily lesson plans, curriculum documents, or national standards.

Program Name: Web Design and Development   Standards Reference Code: **WEB**

Example: WEB.2.3.4

Standards	Content Standard	Performance Standard	Performance Indicator
Web Design and Development	2	3	4

CONTENT STANDARD 1.0: UNDERSTAND THE FOUNDATIONS OF WEB DESIGN AND DEVELOPMENT

PERFORMANCE STANDARD 1.1:	UNDERSTAND THE HISTORY OF WEB DESIGN AND DEVELOPMENT

1.1.1 Describe the role of the World Wide Web Consortium (W3C) in defining web standards

1.1.2 Research the history of the World Wide Web

1.1.3 Compare and contrast the Internet and the World Wide Web

PERFORMANCE STANDARD 1.2:	LAYOUT AND DESIGN THEORY

1.2.1 Explain and apply color theory

1.2.2 Explain and apply the principles of design

1.2.3 Explain and apply the elements of design

1.2.4 Explain and apply effective typography

1.2.5 Evaluate the use of white space

1.2.6 Describe the web design and development cycle

PERFORMANCE STANDARD 1.3:	DEMONSTRATE KNOWLEDGE OF INDUSTRY TERMINOLOGY

1.3.1 Define common terminology and their acronyms

1.3.2 Differentiate between front-end and back-end development

1.3.3 Explain the various roles and careers related to web design

1.3.4 Research career opportunities

PERFORMANCE STANDARD 1.4:	DESCRIBE THE RELATIONSHIP BETWEEN SOCIAL MEDIA AND WEB DEVELOPMENT

1.4.1 Describe the role of social media in web development

1.4.2 Explain the correlation between social media platforms and web links

1.4.3 Describe the relationship of advertising, social media, and websites

1.4.4 Discuss current trends in social media

1.4.5 Create and implement a strategy that uses social networks to drive traffic to a website

PERFORMANCE STANDARD 1.5:	DESCRIBE E-COMMERCE

1.5.1 Define e-commerce as it relates to web development

1.5.2 Demonstrate how to integrate a shopping cart into a web page

1.5.3 Evaluate payment processing options

1.5.4 Discuss security concerns as they relate to e-commerce

CONTENT STANDARD 2.0:   ETHICAL and SECURE USE OF INFORMATION

PERFORMANCE STANDARD 2.1:   UNDERSTAND COPYRIGHT LAWS IN RELATION TO WEB DEVELOPMENT

2.1.1   Research laws that govern intellectual property in diverse forms
2.1.2   Evaluate Creative Commons licensing and other free-content license types
2.1.3   Cite the boundaries of third-party work
2.1.4   Explain terms related to copyright, trademarks, patents, and other intellectual property

---

PERFORMANCE STANDARD 2.2:   UNDERSTAND SECURITY ISSUES IN RELATION TO WEB DEVELOPMENT

2.2.1   Explain invasion of privacy in the use of technology
2.2.2   Model acceptable security practices
2.2.3   Analyze the implications of a personal digital footprint
2.2.4   Differentiate between secure and unsecure web protocols
2.2.5   Explain implications of General Data Protection Regulations (GDPR)
2.2.6   Explain the implications of the California Consumer Privacy Act (CCPA)
2.2.7   Compare and contrast global privacy policies and cultural impact
2.2.8   Describe how a security certificate protects a website

---

PERFORMANCE STANDARD 2.3:   APPLY PERSONAL AND PROFESSIONAL ETHICS

2.3.1   Model legal and ethical use of information
2.3.2   Describe the purpose of a non-disclosure agreement (NDA)
2.3.3   Analyze content for bias

CONTENT STANDARD 3.0:   **PROTOTYPING A WEBSITE**

PERFORMANCE STANDARD 3.1:   **DEVELOP A FILE MANAGEMENT SYSTEM**

3.1.1   Create a maintainable directory structure for a website

3.1.2   Apply appropriate file naming protocols

3.1.3   Demonstrate and use correct file paths for relative and absolute links

3.1.4   Recognize the relationship between local and remote site structures

3.1.5   Develop data backup procedures

PERFORMANCE STANDARD 3.2:   **DEMONSTRATE PROPER LAYOUT TECHNIQUES**

3.2.1   Identify commonly used layout techniques for web design

3.2.2   Develop an appropriate navigation system (site map)

3.2.3   Develop wireframes for initial responsive design concepts

3.2.4   Develop responsive design for various devices

3.2.5   Identify the uses of Cascading Style Sheets (CSS)

PERFORMANCE STANDARD 3.3:   **CREATE WEB CONTENT**

3.3.1   Discuss and differentiate voice, tone, and style as it applies to web writing

3.3.2   Determine the primary and secondary purposes of web content

3.3.3   Identify target audiences and reading levels for specific websites

3.3.4   Identify and create a list of keywords and descriptions (meta tags) to include in web content for search engine optimization (SEO)

3.3.5   Apply grammar and spelling conventions to content

3.3.6   Evaluate existing content for web use (e.g., images, print documents, text, video, etc.)

3.3.7   Create a branding message that will present a professional image

3.3.8   List and describe best practices in content creation that foster indexing and ranking of websites

---

PERFORMANCE STANDARD 3.4:   **CREATE AND EDIT MEDIA FOR THE WEB**

3.4.1   Describe common media file formats

3.4.2   Identify appropriate software for media creation

3.4.3   Create and edit media files (e.g., sound, video, graphics, multimedia)

3.4.4   Optimize media files for uploading using compression tools

3.4.5   Embed media files in a web design

3.4.6   Calculate and convert images to desired sizes and resolution

3.4.7   Manipulate scalable vector graphics (SVG) by altering code

3.4.8   Animate an SVG with CSS

PERFORMANCE STANDARD 3.5:	DEMONSTRATE KNOWLEDGE OF CHALLENGES ASSOCIATED WITH ACCESSIBILITY AND USABILITY

3.5.1	Describe regional, national, and international legal requirements and standards for accessibility on the web
3.5.2	Identify types of disabilities that should be considered when designing websites
3.5.3	Optimize websites to accommodate users with special needs
3.5.4	Explain website usability procedures
3.5.5	Research ADA compliance regulations and policies

CONTENT STANDARD 4.0:   PUBLISHING A WEBSITE

PERFORMANCE STANDARD 4.1:   UNDERSTAND FUNDAMENTALS OF WEB HOSTING

4.1.1   Identify the various server operating systems used to host web pages
4.1.2   Describe how servers work in a hosting environment
4.1.3   Explain the relationship between client and server
4.1.4   Explain common web server maintenance routines
4.1.5   Describe the technical requirements involved in choosing a web host

PERFORMANCE STANDARD 4.2:   DEMONSTRATE PUBLISHING TO THE WEB

4.2.1   Identify the purpose of Secure File Transfer Protocol (SFTP)
4.2.2   Demonstrate the use of SFTP
4.2.3   Preview and test web pages for compatibility using various browsers and output devices
4.2.4   Describe the process of locating and registering a domain name
4.2.5   Explain domain name servers (DNS)

PERFORMANCE STANDARD 4.3:   MAINTAIN WEB CONTENT

4.3.1   Evaluate content with client for relevancy
4.3.2   Evaluate content for viability
4.3.3   Monitor validity of hyperlinks
4.3.4   Maintain and update all website documentation (e.g., prototype, site map, navigation, etc.)
4.3.5   Analyze web analytics for purposes of improving traffic, user experience, and meeting targeted goals

CONTENT STANDARD 5.0:   WEB DEVELOPMENT

PERFORMANCE STANDARD 5.1:   DEVELOP A WEBSITE USING HYPERTEXT MARKUP LANGUAGE (HTML)

5.1.1	Explain the role of Hypertext Markup Language (HTML) in web development
5.1.2	Differentiate among the different forms of HTML
5.1.3	Identify HTML tags for authoring a web page document
5.1.4	Code a basic web page utilizing proper HTML document structure in a text editor
5.1.5	Utilize verification tools to verify code

PERFORMANCE STANDARD 5.2:   DESCRIBE CONCEPTS AND USE OF CASCADING STYLE SHEETS (CSS)

5.2.1	Describe the role of CSS in relation to web design
5.2.2	Identify the structure of CSS style rules
5.2.3	Describe CSS selector types
5.2.4	Differentiate between internal, external, and inline style sheets
5.2.5	Use CSS to style and layout webpage content
5.2.6	Utilize online validation tools for CSS
5.2.7	Compare and contrast static, relative, absolute, and fixed positioning
5.2.8	Describe the function of a CSS preprocessor

PERFORMANCE STANDARD 5.3:   APPLY FOUNDATIONS OF WEB SCRIPTING

5.3.1	Explain the use of current web scripting technologies
5.3.2	Implement scripting (e.g., rollovers, form scripts, etc.)
5.3.3	Compare and contrast client (browser) scripting and server scripting (e.g., PHP, JavaScript, ASP.NET, etc.)
5.3.4	Enhance interactivity of websites using current scripting trends
5.3.5	Compare and contrast static versus dynamic websites
5.3.6	Utilize online validation tools for web scripting

PERFORMANCE STANDARD 5.4:   UNDERSTAND DATABASES

5.4.1	Identify and describe relational databases
5.4.2	Analyze various databases used in web development
5.4.3	Describe the purpose of a database as it relates to web development
5.4.4	Incorporate a database into a website
5.4.5	Utilize online validation tools for databases

PERFORMANCE STANDARD 5.5:   UTILIZE CONTENT MANAGEMENT SYSTEMS IN WEB DEVELOPMENT
5.5.1   Identify content management systems (CMS) (e.g., WordPress, Joomla, etc.)
5.5.2   Evaluate current trends in CMS (e.g., blogging, online magazine, corporate websites, etc.)
5.5.3   Build a theme for a self-hosted CMS

PERFORMANCE STANDARD 5.6:   UTILIZE ONLINE COLLABORATION RESOURCES
5.6.1   Define cloud computing
5.6.2   Compare various cloud computing platforms (e.g., Microsoft Azure, Amazon AWS, Google Cloud, etc.)
5.6.3   Explain the role of version control when developing with a team

CONTENT STANDARD 6.0:   **EMERGING TECHNOLOGIES IN WEB DEVELOPMENT**

PERFORMANCE STANDARD 6.1:   **DEVELOPING A WEB APP**

6.1.1   Analyze current programming languages used in web app development
6.1.2   Compare and contrast a web portfolio site and web app
6.1.3   Explain the purpose of Application Programming Interface (API) in app development
6.1.4   Develop an app using a modern programing language

PERFORMANCE STANDARD 6.2:   **ARTIFICIAL INTELLIGENCE (AI)**

6.2.1   Define Artificial Intelligence (AI)
6.2.2   Explain the role of AI in web development
6.2.3   Describe how AI changes the user experience
6.2.4   Compare data driven versus model driven AI
6.2.5   Explain the significance of data in the development of AI

PERFORMANCE STANDARD 6.3:   **NON-STANDARD WEB CONNECTED DEVICES**

6.3.1   Research Internet of Things (IOT) as it relates to web development
6.3.2   Explain the impact of Digital Assistants on web development

PERFORMANCE STANDARD 6.4:   **VIRTUAL (VR) AND AUGMENTED (AR) REALITY**

6.4.1   Explore use of VR and AR in web design
6.4.2   Research emerging applications of VR and AR in non-entertainment venues