

NPTH 219

Building Web User Interface and Interactions (2 credits)

October 2021

Cohort: AWD01-2112-DL **Term:** 2021-2022: (AWD01-2112-DL) Associate Website Developer (June 2021)

INSTRUCTOR AND CONTACT INFORMATION:

Instructor: Kevin Townsend

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COURSE DESCRIPTION:

Develop an understanding of key concepts for web application interfaces and interactions. Learn how to manage the application life cycle, build the user interface by using HTML5, format the user interface with CSS, and code interactions with JavaScript.

COURSE OBJECTIVES:

- Create the basic structure and elements needed for an HTML5 page and learn how to control internal/external CSS for the flow of content and graphics.
- Utilize JavaScript coding to develop dynamic web applications for user input.
- Create and access data storage with XML and database methods to improve performance of web applications.
- Develop web applications with touch interface to build user interaction.
- Create, test, publish and maintain an app package with web authoring and content management tools.

COURSE TOPICS AND TECHNOLOGY:

- Understanding HTML5 Core Concepts
- Displaying Text and Organizing Content
- Displaying Graphics and Media
- Understanding Core Concepts of CSS
- Arranging the User Interface Using CSS Layouts.
- Managing the Flow of Text Content and the Graphical Interface
- Utilizing JavaScript Coding Essentials, Graphics and Animations
- Accessing Data and Operating System Resources
- Creating the Touch Interface and Accessing Hardware
- Managing the Application Life Cycle

CERTIFICATION PREPARATION ALIGNED WITH THIS COURSE:

Microsoft Technical Associate (MTA)- 98-375: HTML5 Application Development Fundamentals

COURSE DELIVERY METHOD:

This course is separated into weekly modules that will be delivered via synchronous (instructor-led) online instruction and asynchronous (individual learning) online communication. A course week is defined as starting on Sunday at 12:00 AM EST and ending on Saturday at 11:59 PM EST. During each one-week module, students will meet Tuesday, Wednesday and Thursday from 6-7:30 PM EST. When COVID 19 restrictions are lifted, the Tuesday and Thursday session will be held online via the Zoom web conferencing software and in-person at Harrisburg University – Harrisburg Campus.

All course content is organized and delivered in Populi learning management system (LMS).

COURSE PRE-REQUISITES:

A keen interest in web design and development concepts

MINIMUM PRE-REQUISITE SKILLS:

- Basic computer skills
- Basic web and search engine experience
- Basic software download and installation experience

COURSE MATERIALS:

- GMetrix MTA Practice Exams
- MTA LearnKey online courses
- MTA Series: HTML5 Application Development Fundamentals eBook
- Visual Studio Code

LAPTOP REQUIREMENT:

- Students enrolled in NuPaths courses are required to have a laptop computer to complete specific course requirements.
- If you already have a laptop and want to continue using it, please be aware of the minimum required specifications. Email info@nupaths.org for specific laptop requirements.

COURSE GRADING:

This course follows a Pass/Fail grading system. **To pass this course, you must earn a score of 75% or higher and an attendance grade of 80% or higher.** Your class score will be calculated as follows:

Exams/Assessments	30%	(2 Lowest exam scores will be dropped)
Labs	30%	(Completion of all assignment activities)
Course Project	40%	
Total	100%	

ATTENDANCE/PARTICIPATION/TESTING REQUIREMENTS:

Synchronous online live sessions are held for 90 minutes on Tuesday, Wednesday, and Thursday evenings. Students are expected to be in attendance and on time for all synchronous online or in-person live sessions per week. Students must attend at least 80% of the live sessions to be eligible to pass the course. When COVID 19 restrictions are lifted, any students planning to attend in-person for the online live sessions on Tuesday and/or Thursday evening must register their attendance by Monday at 4 PM EST using the form located in the **CONFIRM YOUR ATTENDANCE** lessons on Populi.

Completing assignments, activities and discussion forums posted on Populi are required portions of the course participation and overall grade. Students must login to Populi at least 2 times during each course week*. Any student who does not sign into Populi during the course week will be scheduled for an advising meeting.

* (A course week is defined as starting on Sunday at 12:00 AM EST and ending on Saturday at 11:59 PM EST.)

Absences

If a student will miss a class for illness or other unforeseen circumstances, they must email the instructor as soon as possible. Students are expected to complete all missed assignments as directed by their instructor to meet course and program requirements.

Testing Requirements

This course requires each student to complete the **MTA (98-375): HTML5 Application Development Fundamentals** certification exam at a proctored testing location. During COVID 19, students will take exams online via Certiport's Exams From Home online proctoring venue during the specified weeks of the course. After COVID 19 restrictions have been lifted, each student must contact the instructor at least 10 days before the exam week to confirm the exam date, time and proctored testing location site. This confirmation must be a screenshot of the online registration or an email message from the proctored testing location.

Failure to complete the exam within the provided timeframe will result in a zero for the exam and your overall grade will drop 25 points.

Course Schedule (subject to change to meet course objectives, scheduling and student needs)

Week 1 October 3 – 9, 2021

Lesson 1: Understanding Core Concepts

- Create basic structure and elements needed for an HTML5 page
- Understand how online reference to find available tags & attributes
- Understand how to nest elements
- Understand that there are many HTML editors and developer tools that can be used to develop HTML5 applications
- Create tags and attributes using the correct syntax
- Use the DOCTYPE declaration for HTML5
- Use a meta tag to specify the type of character encoding
- Use entities to display content that includes special characters
- Have a basic understanding of what HTML5, CSS, and JavaScript

Lesson 2: Displaying Text and Organizing Content

- Create headings and paragraphs
- Create hyperlinks to internal and external pages
- Create ordered, unordered, and description lists
- Create tables
- Use an online reference to find available tags and attributes to display text and organize content
- Understand how HTML5 semantic elements to describe content
- Create forms for collecting data from the user
- Use forms validation to create required forms elements
- Use forms validation to ensure collection in the appropriate format

Lesson 3: Displaying Graphics and Media

- Display images using the , <figure> and <figcaption> elements
- Understand how to use internal and external images.
- Understand the difference between raster and vector graphics
- Understand when to use SVG vector graphics & Create an SVG
- Add video and audio to your page using HTML5

Lesson 4: Understanding Core Concepts of CSS

- Create and use internal and external cascading style sheets
- Create CSS rules using ids, classes, elements, and pseudo-classes
- Style text, hyperlinks, and tables
- Understand the difference between block and inline elements
- Change the display of block and inline elements
- Position elements, content with margins, floating elements, positioning
- Handle content overflow with scroll, visible, and hidden

Lesson 5: Arranging the User Interface Using CSS Layouts

- Create layout using CSS box model using margins, borders, padding
- Create a Parent Flex box
- Change the behavior of flex box with direction, wrap, and flow properties
- Change the behavior of child items with flex properties
- Create a Parent Grid Element & Change the number of rows and columns
- Place elements in a grid cell & Control the dimensions of grid rows/columns

Assignments Due Tuesday, October 5 at 4 PM EST

REVIEW:

MTA Series: HTML5 Application Development Fundamentals eBook:

- Lesson 1: Understanding Core Concepts [pp. 1-16]
- Lesson 2: Displaying Text and Organizing Content [pp. 17-40]
- Lesson 3: Displaying Graphics and Media [pp. 43-61]

In Populi: External Learning Tutorials & Resources & Notable Industry Professionals to Follow lesson

Gmetrix LearnKey

- HTML5 Session 1 Training Videos within these Topics:
 - MTA HTML5 Introduction
 - HTML5 Basics
 - Organize Content
 - Forms
 - Add and Configure Images
 - Media in HTML5
 - Session 1 Recap

Instructor Led Live Sessions

Tuesday, Oct 5 Session:

Review:

- Course Intro and Syllabus
- Exam Objectives
- Gmetrix Practice Exams
- Tutorials, Resources & Industry Professionals
- Questions about downloading Visual Studio Code HTML Editor
- Lesson 1: Understanding Core Concepts
- Lesson 2: Displaying Text and Organizing Content

Assignments Due Saturday, October 9 at 11:59 PM EST

REVIEW:

MTA Series: HTML5 Application Development Fundamentals eBook:

- Lesson 4: Understanding Core Concepts of CSS [pp. 63-95]
- Lesson 5: Arranging the User Interface Using CSS Layouts [pp. 97-118]

Gmetrix LearnKey

- HTML5 Session 2 Training Videos within this Topic:
 - Core CSS Concepts
 - CSS and UI Content

ASSIGNMENTS

- Download Visual Studio Code HTML Editor
- Start DB 1.1 Functional Dashboard Layout

GMetrix LearnKey HTML Session 1 Lab (8 Tasks)

Wednesday, Oct 6 Session:

Review:

- Lesson 3: Displaying Graphics & Media
- Explore Exercise 3-2
- Lesson 4: Understanding Core Concepts of CSS
- Explore Exercise 4-9
- Intro to Dashboard Project

ASSIGNMENTS

- Submit DB 1.1 Functional Dashboard Layout

PRACTICE EXAMS

00 GMetrix MTA HTML5 Application Development Fundamentals Test 1 (TESTING mode)

GMetrix LearnKey HTML5 Session 1: Pre-Assessment (23 Q)
GMetrix LearnKey HTML5 Session 1: Post Assessment (37 Q)

Thursday, Oct 7 Session:

Review:

- Lesson 5: Arranging the User Interface Using CSS Layouts
- Explore Exercise 5-1, 5-2 & 5-3
- Assignment Review

PRACTICE EXAMS

01 GMetrix MTA HTML5 Application Development Fundamentals Test 1 (Training mode)

Week 2 October 10 – 16, 2021

Lesson 6: Managing the Flow of Text Content Using CSS3

- Layout a page using multi-column layout
- Create CSS regions to define content flow
- Create content containers and a content source
- Create CSS exclusions for content flow
- Apply hyphenation to text automatically

Lesson 7: Managing the Graphical Interface using CSS3

- Create gradient backgrounds and rounded corners
- Create transparent elements and backgrounds
- Create and apply custom fonts using WOFF
- Move, scale, rotate, and skew elements with transformations
- Use transitions to change CSS properties
- Understand 2D and 3D concepts including perspective
- Create and apply animations
- Create and apply SVG filters on SVG elements

Assignments Due Tuesday, October 12 at 4 PM EST

REVIEW:

Installing and Using FileZilla Directions on Populi

MTA Series: HTML5 Application Development Fundamentals eBook:

- Lesson 6: Managing the Flow of Text Content Using CSS3 [pp. 121-133]

Gmetrix LearnKey

- HTML5 Session 2 Training Videos within this Topic:
CSS and Content Flow

Instructor Led Live Sessions

Tuesday, Oct 12 Session:

Review:

- Lesson 6: Managing the Flow of Text Content Using CSS3
- Explore Exercise 6-2
- Assignment Review
- Google Fonts
- Footer Design
- Adobe Color

Assignments Due Saturday, October 16 at 11:59 PM EST

REVIEW:

MTA Series: HTML5 Application Development Fundamentals eBook:

- Lesson 7: Managing the Graphical Interface using CSS3 [pp. 135-164]

Gmetrix LearnKey

- HTML5 Session 2 Training Videos within these Topics:
 - CSS and Graphics
 - Session 2 Recap

ASSIGNMENTS

- Start DB 2.1 Multi-Column Layout with Animation

Wednesday, Oct 13 Session:

Review:

- Lesson 7: Managing the Graphical Interface using CSS3
- Explore Exercises 7-1, 7-2, 7-3, 7-4 & 7-5

ASSIGNMENTS

- Submit DB 2.1 Multi-Column Layout with Animation
- Upload your Dashboard files to the web using FileZilla

GMetrix LearnKey HTML Session 2 Lab (8 Tasks)

PRACTICE EXAMS

02 GMetrix MTA HTML5 Application Development Fundamentals Test 2 (Training mode)

GMetrix LearnKey HTML5 Session 2: Pre-Assessment (20 Q)

Thursday, Oct 14 Session:

Review:

- Continue Lesson 7 Exercises
- Explore Exercises 7-6, 7-7, 7-8, & 7-9
- Explore Exercises 7-11, 7-12, & 7-13
- Assignment Review

PRACTICE EXAMS

GMetrix LearnKey HTML5 Session 2: Post Assessment (30 Q)

Week 3 October 17 – 23, 2021

Lesson 8: JavaScript Coding Essentials

- Embed JavaScript in your web page directly or from a linked .js file
- Change HTML elements using JavaScript
- Create variables and perform calculations
- React to events and create EventListeners
- Check conditional statements and perform loops
- Create functions and functions with parameters
- Use local and hosted JavaScript libraries
- Use jQuery plugins in your web applications

Assignments Due Tuesday, October 19 at 4 PM EST	Instructor Led Live Sessions	Assignments Due Saturday, October 23 at 11:59 PM EST
REVIEW: MTA Series: HTML5 Application Development Fundamentals eBook: <ul style="list-style-type: none"> • Lesson 8: JavaScript Coding Essentials [pp. 167-197] Gmetrix LearnKey <ul style="list-style-type: none"> • HTML5 Session 3 Training Videos within these Topics: <ul style="list-style-type: none"> • JavaScript Introduction • Update the UI with JavaScript 	Tuesday, Oct 19 Session: Review: <ul style="list-style-type: none"> • Lesson 8: JavaScript Coding Essentials • Explore Exercises 8-1, 8-2 & 8-3 • Assignment Review 	REVIEW:
ASSIGNMENTS <ul style="list-style-type: none"> • Start DB 3.1 JavaScript Date/Time 	Wednesday, Oct 20 Session: Review: <ul style="list-style-type: none"> • Lesson 8: JavaScript Coding Essentials (continued) • Explore Exercises 8-4 & 8-5 	ASSIGNMENTS <ul style="list-style-type: none"> • Submit DB 3.1 JavaScript Date/Time
PRACTICE EXAMS GMetrix LearnKey HTML5 Session 3: Pre-Assessment (21 Q)	Thursday, Oct 21 Session: <ul style="list-style-type: none"> • Lesson 8: JavaScript Coding Essentials (continued) • Explore Exercises 8-6, 8-7 & 8-8 • Assignment Review 	PRACTICE EXAMS 03 GMetrix MTA HTML5 Application Development Fundamentals Test 3 (Training mode)

Week 4 October 24 – 30, 2021

Lesson 9: JavaScript Graphics and Animations

- Create the HTML5 canvas element
- Use JavaScript to draw graphics on the canvas
- Use the getContext method to access methods and properties for drawing on the canvas
- Understand how a circle is created using the arc method
- Create more than one line or path method on the same canvas
- Create rectangles, apply gradients, draw images, and draw filled or outlined text on the canvas
- Use the setInterval and setTimeout methods to create a JavaScript animation
- Create an animation using JavaScript on the canvas

Assignments Due Tuesday, October 26 at 4 PM EST	Instructor Led Live Sessions	Assignments Due Saturday, October 30 at 11:59 PM EST
REVIEW: MTA Series: HTML5 Application Development Fundamentals eBook: <ul style="list-style-type: none"> • Lesson 9: JavaScript Graphics and Animations [pp. 199-223] Gmetrix LearnKey <ul style="list-style-type: none"> • HTML5 Session 3 Training Videos within this Topic: <ul style="list-style-type: none"> ◦ Animations with JavaScript 	Tuesday, Oct 26 Session: Review: <ul style="list-style-type: none"> • Lesson 9: JavaScript Graphics and Animations • Explore Exercises 9-1, 9-2, 9-3 & 9-4 • Assignment Review 	REVIEW:
ASSIGNMENTS <ul style="list-style-type: none"> • Start DB 4.1 Canvas Drawing with Animation 	Wednesday, Oct 27 Session: Review: <ul style="list-style-type: none"> • Lesson 9: JavaScript Graphics and Animations (continued) • Explore Exercises 9-5, 9-6 & 9-7 	ASSIGNMENTS <ul style="list-style-type: none"> • Submit DB 4.1 Canvas Drawing with Animation
PRACTICE EXAMS GMetrix LearnKey HTML5 Session 3: Post Assessment (36 Q)	Thursday, Oct 28 Session: Review: <ul style="list-style-type: none"> • Lesson 9: JavaScript Graphics and Animations (continued) • Explore Exercises 9-8 & 9-9 • Assignment Review 	PRACTICE EXAMS 04 GMetrix MTA HTML5 Application Development Fundamentals Test 1 (Training mode)

Week 5 October 31 – November 6, 2021

Lesson 10: Access Data and Operating System Resources

- Create and send a request for data using XMLHttpRequest()
- Parse XML data and display it in the web browser
- Create and use an IndexedDB database to make web application data available offline
- Create, access, and delete localStorage data on the client device
- Create, access, and delete sessionStorage data on the client device
- Create a manifest .appcache file to make your web application available offline

Lesson 11: The Touch Interface and Accessing Hardware

- Respond to touch events
- Respond to touch, mouse, and pen events using pointer events
- Create a web worker to perform background tasks
- Use the geolocation API to get the current location of a user's device
- Use the file API to read images stored on the client's device
- Access information provided by the motion sensing hardware about the orientation of a device
- Access the camera and microphone on a device

Assignments Due Tuesday, November 2 at 4 PM EST	Instructor Led Live Sessions	Assignments Due Saturday, November 6 at 11:59 PM EST
REVIEW: MTA Series: HTML5 Application Development Fundamentals eBook: <ul style="list-style-type: none"> • Lesson 10: Access Data and Operating System Resources [pp. 225-245] • Lesson 11: The Touch Interface and Accessing Hardware [pp. 247-279] Gmetrix LearnKey <ul style="list-style-type: none"> • HTML5 Session 3 Training Videos within this Topic: <ul style="list-style-type: none"> ◦ JavaScript and Data 	Tuesday, Nov 2 Session: Review: <ul style="list-style-type: none"> • Lesson 10: Access Data and Operating System Resources • Explore Exercise 10-1 • DB 5.1 XML Data Storage Assignment Review • Explore Exercises 10-2, 10-3 & 10-4 • DB 5.2 IndexedDB Data Construct Assignment Review 	REVIEW: Gmetrix LearnKey <ul style="list-style-type: none"> • HTML5 Session 3 Training Videos within these Topics: <ul style="list-style-type: none"> • Touch Interfaces and APIs • Device and Operating System Resources • Session 3 Recap
ASSIGNMENTS <ul style="list-style-type: none"> • Start DB 5.1 XML Data Construct • Start DB 5.2 IndexedDB Data Construct • Start DB 5.3 Geolocation API GMetrix LearnKey HTML Session 3 Lab (4 Tasks)	Wednesday, Nov 3 Session: Review: <ul style="list-style-type: none"> • Lesson 11: The Touch Interface and Accessing Hardware • Explore Exercises 11-1, 11-2, 11-3 & 11-4 • DB 5.3 Geolocation API Assignment Review 	ASSIGNMENTS <ul style="list-style-type: none"> • Submit DB 5.1 XML Data Construct • Submit DB 5.2 IndexedDB Data Construct • Submit DB 5.3 Geolocation API
PRACTICE EXAMS 05 GMetrix MTA HTML5 Application Development Fundamentals Test 2 (Training mode)	Thursday, Nov 4 Session: Review: <ul style="list-style-type: none"> • Lesson 11: The Touch Interface and Accessing Hardware (continued) • Explore Exercises 11-5, 11-6 & 11-7 • DB 5.3 Geolocation API Assignment Review (continued) 	PRACTICE EXAMS <ul style="list-style-type: none"> • GMetrix LearnKey HTML5 Session 3: Post Assessment (39 Q) • PRACTICE TEST - HTML5 Application Development Fundamentals in Populi (Start preparing for the exam next week.)

Week 6 November 7 - 13, 2021

Lesson 12: Manage the Application Life Cycle

- Understand the Application Life Cycle
- Use local and session storage to manage the state of your application
- Validate your HTML markup using the W3C Markup Validation Service
- Validate your CSS using the W3C CSS Validation Service
- Create an app Package using Visual Studio
- Use the Windows App Certification Test Kit to validate your app Package
- Publish an app to the Windows Store

Assignments Due Tuesday, November 9 at 4 PM EST	Instructor Led Live Sessions	Assignments Due Saturday, November 13 at 11:59 PM EST
REVIEW: MTA Series: HTML5 Application Development Fundamentals eBook: <ul style="list-style-type: none"> • Lesson 12: Manage the Application Life Cycle [pp. 281-300] Gmetrix LearnKey <ul style="list-style-type: none"> • HTML5 Session 4 Training Videos within these Topics: <ul style="list-style-type: none"> • Platform Fundamentals • Manage Application States • Debug and Test Touch-Based Apps • Session 4 Recap • Course Recap 	Tuesday, Nov 9 Session: Review: <ul style="list-style-type: none"> • Lesson 12: Manage the Application Life Cycle • Explore Exercise 12-1 & 12-3 • DB 6.1 Validation and Publish – Final Project Assignment Review 	REVIEW:
ASSIGNMENTS <ul style="list-style-type: none"> • Start DB 6.1 Validation and Publish – Final Project GMetrix LearnKey HTML Session 4 Lab (2 Tasks)	Wednesday, Nov 10 Session: Review: <ul style="list-style-type: none"> • Exam Prep 	ASSIGNMENTS <ul style="list-style-type: none"> • Submit DB 6.1 Validation and Publish – Final Project • Upload MTA (98-375) HTML5 Application Development Exam Score Report
PRACTICE EXAMS GMetrix LearnKey HTML5 Session 4: Pre-Assessment (7 Q) 06 GMetrix MTA HTML5 Application Development Fundamentals Test 1 (TESTING mode) Retake the PRACTICE TEST - HTML5 Application Development Fundamentals in Populi	Thursday, Nov 11 Session: Review: MTA (98-375): HTML5 Application Development EXAM	PRACTICE EXAMS GMetrix LearnKey HTML5 Session 4: Post Assessment (13Q)