Florida Digital Discoveries in Society Syllabus

Middle School (140 Contact Hours)

Course Overview and Goals

The Florida Digital Discoveries in Society course introduces students to key concepts in programming, digital communication, and technology's role in society. Students begin by learning JavaScript basics before creating interactive programs and games. The course also covers the fundamentals of computer hardware, the internet's infrastructure, and network security, while emphasizing digital etiquette and online safety. Students will design and build websites using HTML, CSS, and principles of web layout and aesthetic design. Additionally, they will explore the micro:bit, learning how to program with sensors and control structures to create hands-on projects.

Learning Environment

The course utilizes a blended classroom approach. The content is a mix of web-based and physical activities. Each module of the course is broken down into lessons. Lessons are composed of short video tutorials, interactive learning pages, quizzes, explorations, simulations, and free-response prompts.

Technology Requirements

To complete all activities and exercises in this course, students must have access to the 3rd party sites and tools listed here: Florida Digital Discoveries in Society Course Links

Prerequisites

The Florida Digital Discoveries in Society course is designed for complete beginners with no previous background in computer science. The course is highly visual, dynamic, and interactive, making it engaging for those new to computer science.

More Information

Browse the content of this course at https://codehs.com/course/24986/overview

Course Breakdown

Module 1: Programming in JavaScript (1-1.5 weeks/5-8 hours)

Students learn the basics of JavaScript including variables, user input, mathematics, and functions.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34625

Topics Covered	• Computational Thinking • Intro to JavaScript • Printing • Variables • User Input • Basic Math

	● Basic Functions ● Pseudocode
Example Assignments	● How to Think Like a Programmer ○ Students learn about computational thinking techniques and practice decomposing processes and writing repeatable algorithms. ● Intro to JavaScript ○ Students encounter JavaScript for the first time and learn how to print text to the console. ● Variables ○ Students practice using variables in a variety of contexts – making purchases, olympic winners, and a hiking app. ● User Input ○ Students develop a program that asks users for input to complete a Mad Lib story. ● Basic Math ○ Students use mathematical calculations to write a program for a bookstore and animate a graphical pigeon.

Module 2: Intro to Game Design (1-1.5 weeks/5-7 hours)

Students reflect on their game-playing experience and learn more about major video game topics and categories.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34624

Topics Covered	● Introduction to Games ● Gameplay Elements ● Game Perspectives ● Game Genres
Example Assignments	● Introduction to Games ○ Students begin to reflect on the variety of games they have played and what actually makes a game a game. ● Unpacking a Game ○ Students explore and learn to identify game elements, mechanics, and components that make up the overall gameplay experience. They play a free online game in order to practice noticing the different pieces involved. ● Categorizing Games ○ Students learn about game perspectives and genres as a way to categorize games by their styles and gameplay elements. They practice by classifying a few popular games.

Module 3: Getting to Know Game Design (2 weeks/10 hours)

Students learn about JavaScript libraries and how to create the basic structure of an animated or interactive program.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34626

Topics Covered	- Introduction to Libraries - Program Structure - Canvas - Sprites and Properties

Example Assignments	- Introducing Libraries
	  ○ Students get their first glimpse of how powerful, and fun, the JSGameLib library is.
	- Program Structure
	  ○ Students create two animations using setup() and draw() functions.
	- Understanding the Canvas
	  ○ Students create their first canvas and practice using the coordinate system to place boxes on shelves.
	- Your First Sprites
	  ○ Students show their canvas and sprite expertise by recreating a classic Mario screenshot with basic shapes.
	- The Physics of Sprites
	  ○ Students work through a variety of simple programs in order to better understand physics-related sprite properties.

Module 4: Mini Golf (4-5 weeks/20-25 hours)

Students incrementally develop a mini golf game, learning more about important computer science topics like booleans and if/else statements.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34627

Topics Covered	- Project Design Process - Sprite and World Configuration - Booleans - If/Else Statements - Player Interactions - Adding Effects - User Interfaces
Example Assignments	- As students progress through this project module's lessons, they develop an interactive mini golf game. They practice working with sprites and their properties, and after learning about Booleans and if/else statements, enable the player to interact with the sprites. At the end of the project, students get to be creative and make a 2nd mini golf hole of their own design!

Module 5: Intro to the Internet (1 week/5 hours)

Students learn about the internet, its infrastructure, and how it works.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34629

Topics Covered	● History of Computing ● Bits, Text, and Numbers ● What is the Internet? ● Binary ● IP Addresses
Example Assignments	● Computers Speak Binary ○ *Write a Message in Binary: In this activity, you will use ASCII encoding to write the same message in binary. Then, you will trade messages with a partner and use ASCII encoding to figure out your partner's message.* ● IP Addresses ○ *IoT IP Address Scavenger Hunt:* Explore the house to find all 9 of the devices with an IP address! Click on the device to find the IP address. Then, note the device and its address in the corresponding free response activity.

Module 6: Computers and Networking (1-2 weeks/5-10 hours)

Students learn about the essential components of computers, including internal parts, peripheral devices, storage options, and network devices. They also explore cloud computing and network security.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34642

Topics Covered	● Properties and Definitions of Computers ● Types of Computers ● Strengths and Limitations of Computers ● Internal Computing Components ● Peripheral Devices ● Storage Types and Security ● Cloud Computing ● Network Devices ● Network Options ● Network Communication
Example Assignments	● Peripheral Devices ○ *Your Ideal Computer Setup:* What would YOU want in a computer setup? Explain your ideal computer setup, including all of the peripherals that you would include. Consider the following questions to help form your response: Would your devices be wired or wireless? Would your setup be portable or remain in one room? Don't forget to include a list of all of the peripheral devices that you would need to create your ideal computer setup. ● Cloud Computing ○ *Case Study: Cloud Computing vs. Physical Computing:* Is cloud computing more efficient? Is physical computing the way to go? Take some time to read through this case study for a middle school that needs to decide between implementing a cloud computing solution

	or a physical computing solution. What are the pros and cons of each? Which way would you ultimately choose to implement? In the next activity, you will be faced with a different scenario and need to decide if cloud computing is appropriate. ● Network Communication ○ *Iptables Simulation:* Work through the interactive iptables simulation!

Module 7: Exploring Digital Citizenship (2 weeks/10 hours)

Students learn about Internet etiquette and how to stay safe on the world wide web.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34633

Topics Covered	● Digital Footprint ● Cyberbullying ● Internet Safety ● Privacy & Security ● Information Literacy ● Copyright ● Hacking Ethics ● Cyber Hygiene
Example Assignments	● Digital Footprint and Reputation ○ *Building a Positive Digital Footprint:* Spend some time reflecting on you and your friends' social media activity. Give an example of a social media post that builds a positive digital footprint. How does the post build a positive digital footprint? Give an example of a social media post that builds a negative digital footprint. How does the post build a negative digital footprint? Thinking about your digital footprint, are you going to make any changes in what you post on social media? How about what you write to share in a group message? Why or why not? ● Internet Safety ○ *Scenario: School Stranger:* You begin to receive direct messages on Instagram from a person you don't recognize. They claim to go to your school, and they know a lot of information about your classes and teachers. They also follow a lot of your classmates, so you believe them. After a bit, they start asking questions about you and your friends. What steps should you take to respond to this situation? ● Information Literacy ○ *Evaluate the Source 1:* Take a look at this resource, and consider the following questions: What evidence do you see that this source is credible? What evidence do you see that makes you question the source's credibility? Is this a credible source?

Module 8: Exploring Web Design (2 weeks/10 hours)

Students explore HTML and CSS styling as they work to create their homepage.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34634

Topics Covered	- How do we build web pages? - Markup Languages - HTML - HTML tags - HTML attributes - HTML elements - The Anatomy of an HTML page - Formatting text - Hyperlinks - Images - Lists - Styling with HTML - HTML Colors
Example Assignments	Students create several web pages to practice each of the concepts above. - Example exercises: ○ Modify existing web pages using formatting tags to make text more readable. ○ Use links to create a web page linking to your 5 favorite websites ○ Use links and images to create a personal library web page showing your favorite books ○ Use lists and images to create a ashy list article ○ Use tables to create a personal calendar web page ○ Use styling attributes to add style to your web pages

Module 9: Project: Creating a Website (2 weeks/10 hours)

Students will design and build their own websites, applying key principles of aesthetic design, multimedia integration, and effective web layout.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34853

Topics Covered	- HTML - CSS - Webpage Aesthetics - Webpage design - Copyright
Example Assignments	- Project Kickoff! ○ *Create a Community Website:* In this project, you'll use your web design skills to create a website that highlights a group of people who share something in common. The **community** you choose could be your neighborhood, a club you're in, or even a group of people who love the same video game! You will research, design, and create a website that highlights different aspects of this community, such as its history, culture, events, and people.

Module 10: Intro to micro:bit (2 weeks/10 hours)

Students learn the basics of the micro:bit, such as how to light up and change the brightness of LEDs and how to use variables to write more versatile programs.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34638

Topics Covered	- Intro to physical computing - Goal Setting - Comments - Pseudocode - Analog vs. digital - Variables - Connecting external components
Example Assignments	- Setting Up your micro:bit ○ *Blinking Diamond:* Blink LEDs between a large diamond shape and small diamond shape every half a second as long as the program is running. - Comments & Pseudocode ○ *Moving Bright Box:* Light the corners on the grid with the highest brightness for half a second. Light the corners of the inner box with a brightness of 150 for half a second. Light the middle LED with a brightness of 50 for half a second. Repeat until the program is manually ended. - Variables ○ *Opposite Blinking External LEDs*: Blink two external LEDs opposite one another. One LED should be lit while the other is off. After 1 second, the lit LED should turn off and the unlit LED should turn on. After 1 second, they should switch again. This should continue until the program is manually ended.

Module 11: Program Control with micro:bit (3 weeks/15 hours)

Students combine control structures, such as if/else statements and loops, with the micro:bit built-in and external sensors to write programs that react to the outside world.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34639

Topics Covered	- For loops - While loops - Variables - Making sound - If statements - If/else statements - Using buttons - Using servo motors - Operators (arithmetic, comparison, and logical) - Using sensors (light, temperature, acceleration, distance) - Functions and parameters

Example Assignments	● For Loops ○ *Twinkle Twinkle:* Control your micro:bit to play Twinkle Twinkle Little Star! Use loops (maybe more than one!) to play the song until the program is manually stopped. ● If/Else Statements ○ *Servo Position by Button Press:* Increase the servo position by 90 degrees each time Button A is pressed. Decrease the servo position by 90 degrees each time Button B is pressed. Repeat this motion until the program is manually ended. ● Operators ○ *Temperature Monitor:* Create a temperature monitor. If the temperature is between 60 and 70 degrees fahrenheit, the middle LED should stay on. If the temperature is below 60 or above 70 degrees fahrenheit, the middle LED should blink on and off at a speed of a quarter second. Repeat this motion until the program is manually ended. ● Functions ○ *LED Arrow Following Servo:* When button A is pressed, increase the servo position by 90 degrees. When button B is pressed, decrease the servo position by 90 degrees. Use functions to light an LED arrow on the screen that points in the direction of the servo (up, down, left, or right).

Module 12: Advanced micro:bit (4 weeks/20 hours)

Students explore all of the capabilities of the micro:bit on their own as they research, explore, and teach their peers about new sensors.

Browse the full content of this unit at https://codehs.com/course/24986/explore/module/34640

Topics Covered	● Challenges ● Explore a new sensor ● Build a step-by-step project ● Final project
Example Assignments	● Explore a New Sensor ○ Research a sensor we have not studied in this course and explore how it is used. In a group, develop and present a lesson to teach your peers about your chosen sensor, including exercises where they can practice using the sensor for themselves. ● Build a Step-By-Step Project ○ Find a ready-made project online. Follow the steps to recreate the project using your micro:bit and any needed materials. ○ Create an updated set of directions complete with pictures and tips from your experience. ● Final project ○ Use your micro:bit to bring an idea to life using sensors and external components. ○ Present your project to peers, administration, and family