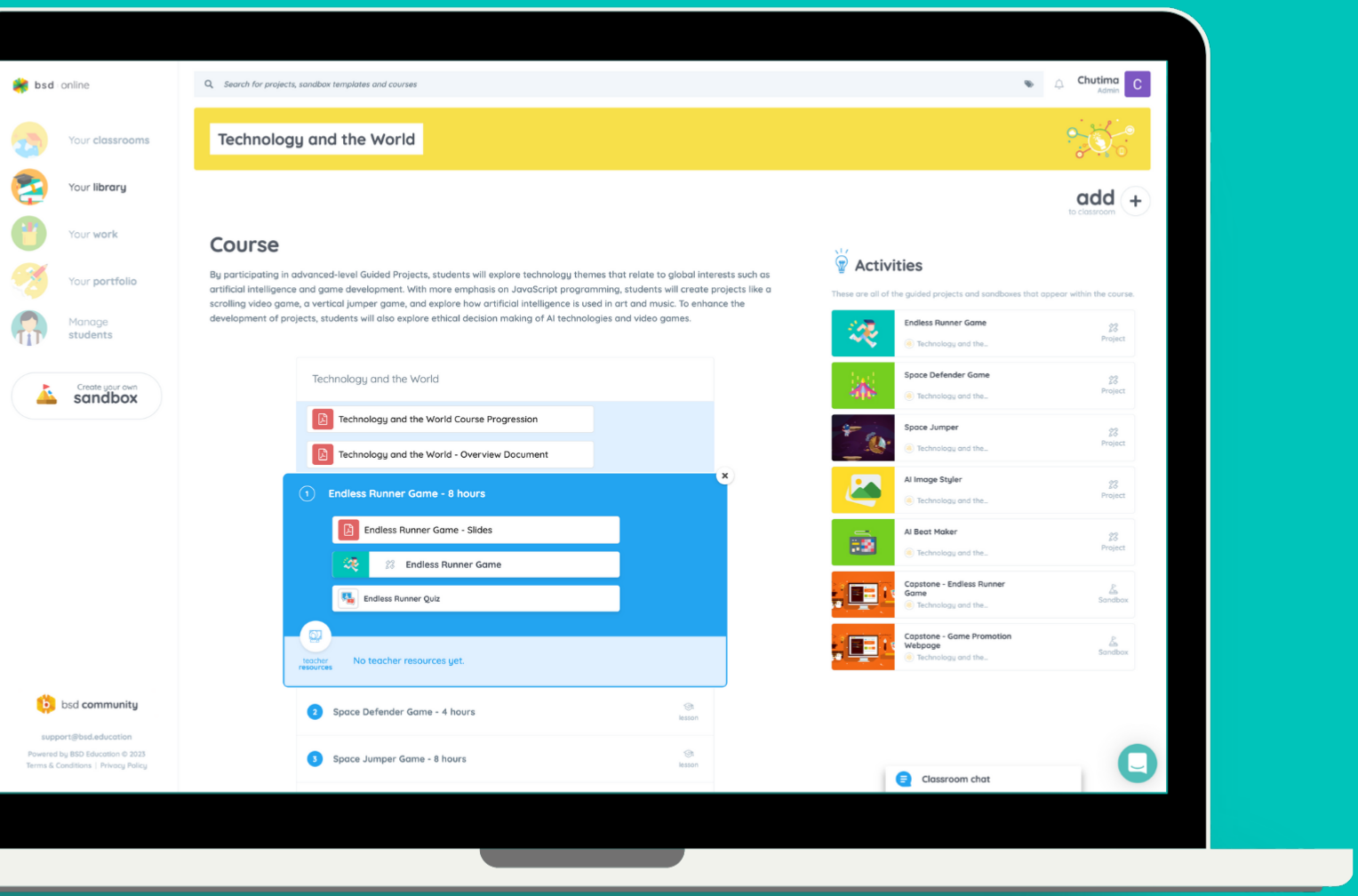


2024 Curriculum Guide

bsd education

www.bsd.education

TechReady

TechReady is a program designed to empower students in developing skills needed for the real world, which involve digital literacy, computational thinking, design thinking, data analysis and understanding of user experience.

Along with these technology-focused skills, TechReady also provides experiences in social-emotional learning, play and self-directed opportunities for students.

TechConnected

TechConnected is made up of 18 guided projects that are designed to be adapted to any subject, allowing students to customize and focus on content creation.

Each TechConnected project can be completed in between 45-90 minutes depending on how students customize the content.

TechNovators

TechNovators courses are designed to be used in out-of-school time environments like camps, clubs, afterschool programs, summer enrichment and other similar uses. Each course is up to 25 hours and explores themes like, website development, game development, App Development, VR and even AI.

Each course is centered around a series of guided projects that students work through to learn new digital skills. Once the guided projects are completed, students can customize their projects and share them as a portfolio of work. Along the way students will learn additional skills in design thinking, computational thinking and digital citizenship.

TechFuture

The TechFuture program is designed to give students, ages sixteen plus, a chance to explore how technology has transformed different digital industries.

Students will apply the learning by building real-world projects using industry standard tools.
The six courses cover topics in design, programming, data analysis and organization, as well as digital marketing. Students will apply skills within a range of industry themes and job activities to expand their understanding and opportunities of where their own greatest interests lie related to the world of professional digital industries.

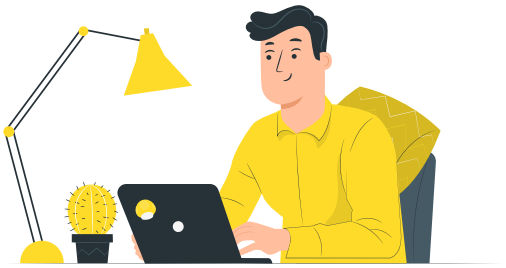
Each course is 40 hours and can be done together in the recommended order (240 hours), or individually. The courses are designed to give students opportunities to practice their skills, project management, as well as communication, digital literacy and digital citizenship. This programme is essential to the modern workplace.

TechReady

TechReady is a program designed to empower students in developing skills needed for the real world, which involve digital literacy, computational thinking, design thinking, data analysis and understanding of user experience.

Along with these technology-focused skills, TechReady also provides experiences in social-emotional learning, play and self-directed opportunities for students.

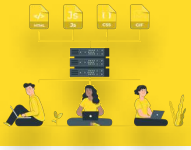
Tech Ready | Tech Connected | Tech Novators | Tech Future



TechReady explores connections between computing, digital citizenship, and themes in technology. Students will be challenged to investigate how their own lives, community, society and different industries are impacted by technology. To articulate and apply this knowledge, students will research, plan, prototype and create digital artifacts using technical skills and concepts through completing Guided Projects. Students will be led through a variety of Guided Projects that span across a wide range of disciplines in technology such as **Data, Game Development, Web Design, App Development, Artificial Intelligence, and Digital Communication.**

The Curriculum is Divided into **3 Courses**

Beginner (40 hours)
Technology and Me



Intermediate (40 hours)
Technology and the Community

Advanced (40 hours)
Technology and the World

Aims of **TechReady**

1. Communicate effectively with digital media.
2. Practice collaborative skills as an informed digital citizen.
3. Apply different uses of technology to multiple real-world scenarios.
4. Build digital artifacts using HTML, CSS, and JavaScript.
5. Expand their knowledge and understanding of the real-world application of technology tools across different industries.
6. Exercise the fundamental principles and processes of computational thinking, design thinking, and user experience design.
7. Articulate their findings and share their conclusions.

Structure of **TechReady**

TechReady is designed to be led by an instructor in a virtual, hybrid or offline learning environment, with the possibility of allowing students to complete Guided Projects self-paced or asynchronously. All TechReady lessons center around the completion of a Guided Project that, once finished, provides students with their own digital artifact customised to their individual creative vision and ideas.

Following our 3-step approach to curriculum **Explore, Learn & Create,** learning unfolds by **exploring** new concepts, **learning** tools and methods needed to produce a digital artifact and then **creating** the artifact in a Guided Project.
*Project descriptions can be found on BSD Online.

Explore — Students will be introduced to new topics and subjects in an engaging way. Students will encounter videos, interactive games and other introductory materials.

Learn — Teachers will lead students through more detail and teach concepts that are needed to complete the Create phase successfully. Teachers will be provided with slides, instructional notes, student worksheets and other resources for teaching.

Create — Students will be working on a BSD Guided Project or other creative endeavours to synthesize what they have learned in the previous steps. Once the Guided Project is complete, students will be able to customize further or share their work with a public URL.

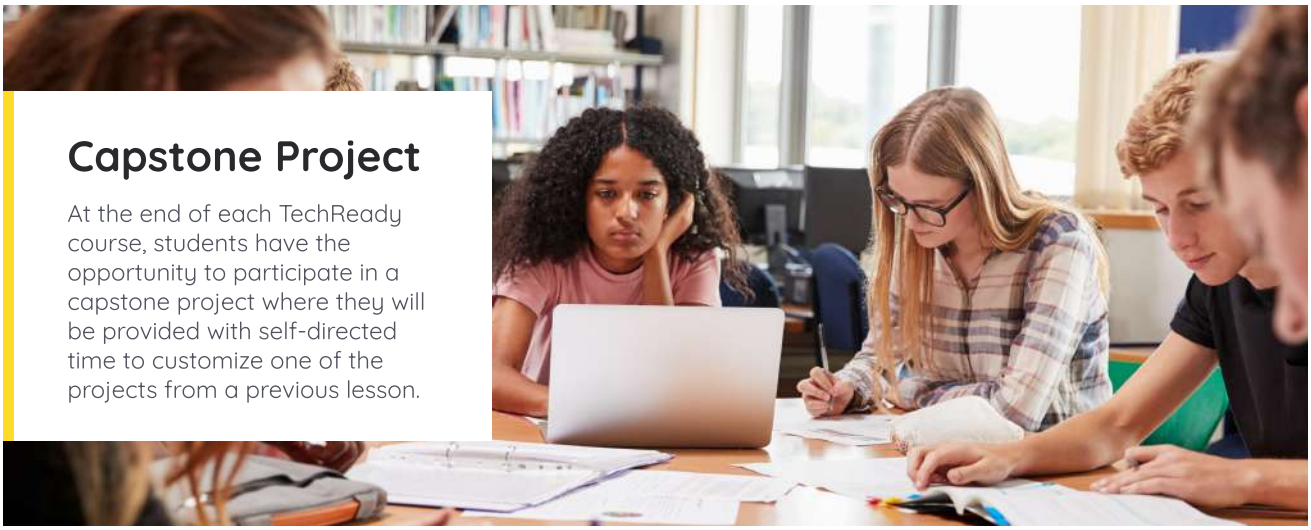
BSD Education has earnd the **Research-Based Design Product Certification from Digital Promise.**

The Research-Based Design Product Certification uses a competency-based learning framework, developed in consultation with Digital Promise's Learner Variability Project advisory board, expert researchers in the Learning Sciences field, and nearly 50 educators across the United States.

Assessment

Each Guided Project is accompanied by a multiple choice quiz that tests students' understanding of coding concepts and syntax. Student progress and results will be shared in the Classroom on BSD Online.

At the end of each Guided Project, students will also be given an opportunity to provide a written reflection of their work, which can be assessed by a teacher with a provided rubric.



Capstone Project

At the end of each TechReady course, students have the opportunity to participate in a capstone project where they will be provided with self-directed time to customize one of the projects from a previous lesson.

TechReady
Course Descriptions

Beginner (40 hours)
Technology and Me

Intermediate (40 hours)
Technology and the Community

Advanced (40 hours)
Technology and the World

Technology and Me (Beginner)
40 Hours

As new explorers of technology, students will make connections to technology by participating in entry-level Guided Projects that allow them to share their own personal experiences and interests. Students will learn introductory skills in HTML and CSS while exploring basic concepts in JavaScript. Students will create their own personal web-page, a blog, make their own quiz game and develop other similar digital artifacts. These projects will teach the basics of web design along with critical digital skills like design thinking, prototyping and digital citizenship.

Explore

Students will be introduced to methods and design protocols that real web-designers use and will explore how to interact and engage safely in online environments through activities that develop digital citizenship.

Learn

Teachers will lead students through 7 Guided Projects that teach the necessary skills in HTML, CSS and JavaScript to design custom web pages that will start to cultivate computational thinking. Students will also learn how to plan out project ideas as a design process.

Create

Students will create 7 unique projects throughout the course. At the end of the course, students will be asked to customize a project of their choice as a capstone to the course. Each of the projects will be customizable and can be shared using a public URL or QR code.

Project	Description	Duration
Recipe Card	Explore introductory concepts in HTML and CSS to design and build a recipe card from a favorite dish. Along the way learn about planning out web designs and how to prepare all of your digital content for development.	4 hours
Personal Webpage	Design and build a personal webpage that includes images, links and descriptions of things that describe who you are and what you do. Explore themes in online privacy to make good choices about what to share and what not to share.	4 hours

Project	Description	Duration
Digital Citizenship Guide	Investigate best practices in online safety before making a digital citizenship guide with the do's and don'ts of online safety. Consider rules to make that keep us safe when interacting online.	6 hours
Online Profile	Design an online presence profile for a fictitious online community that shows your role in the online community. Explore how online communities communicate with respect for privacy.	6 hours
Blog	Create a multi-post blog on an interesting topic and explore how bloggers share what is important to them. Explore how to use license-free imagery to add unique images to the blog.	4 hours
JavaScript Chatbot	Explore JavaScript fundamentals to make an interactive digital conversation game that can be customized with new responses. To build up skills in JavaScript, learn how to make alerts, prompts and how logic operators work.	6 hours
Trivia Game	Expand on JavaScript fundamentals to make an interactive trivia game that can be customized with new questions. To broaden skills in JavaScript, learn how to use variables and math operators.	4 hours
Capstone		
Personal Webpage Sandbox	Elaborate on the Personal Webpage project to include more sections and information to create a full personal web page. Work in Sandbox mode for unlimited creativity.	6 hours
Blog Sandbox	Elaborate on the Blog project to include more posts and information to create a full personal blog on a topic of your choice. Work in Sandbox mode for unlimited creativity.	6 hours

Technology and the Community (Intermediate)

40 Hours

Students will explore intermediate-level Guided Projects that connect to community themes like making a mobile app, designing a health logger and multi-page website for a community organization. By building on previous learning from Technology and Me, students will learn more skills in developing with HTML, CSS and JavaScript. Along with learning more advanced coding concepts, students will explore best practices in digital design for optimal user experience, data analysis and digital communication.

Explore

Students will be introduced to methods and design protocols that real web-designers use and will explore how data is used to inform the design of applications. By looking at industry examples of applications and designs, students will consider how user experience affects design decisions.

Learn

Teachers will lead students through 5 Guided Projects that teach the necessary skills in HTML, CSS and JavaScript to design custom web pages that will continue to cultivate computational thinking. Students will also learn how to gather real-world data for use in projects.

Create

Students will create 5 unique projects throughout the course. At the end of the course, students will be asked to customize a project of their choice based on the 2 project briefs that are provided. Each of the projects will be customizable and can be shared using a public URL or QR code.

Project	Description	Duration
Interactive Story	Build an interactive story using a combination of logic, JavaScript functions, and creativity to make an organized story tree. Consider design and theme choices to attract targeted audiences.	8 hours
Multi-Page Website	Design and build a multi-page website for a fictional community organisation. Collect user data and feedback on design choices and how to incorporate the needs of the community organization.	6 hours
Volunteer Search	Use data filters to design a web app that can help people find the different types of volunteer organizations. Learn which data filters provide the most beneficial information to users.	4 hours
Donation Calculator	Collect real-world financial data like income and expenses while designing a donation calculator. Analyze raw data and consider user experience in the display data so that it is useful.	6 hours
To-Do List Web App	Design a web app that can track your to-do list and learn how to program with more advanced JavaScript syntax. Explore ways that apps can be designed to fit the needs of multiple different types of users.	4 hours
Capstone		
Interactive Story Sandbox	Elaborate on the Interactive Story project to include story segments and more story choices. Work in Sandbox mode for unlimited creativity.	6 hours
Multi-Page Website Sandbox	Elaborate on the Multi-page Website project to include more pages and detailed information for a proposed customer. Work in Sandbox mode for unlimited creativity.	6 hours

Technology and the World (Advanced)

40 Hours

By participating in advanced-level Guided Projects, students will explore technology themes that relate to global interests such as artificial intelligence and game development. With more emphasis on JavaScript programming, students will create projects like a scrolling video game, a vertical jumper game, and explore how artificial intelligence is used in art and music. To enhance the development of projects, students will also explore ethical decision making of AI technologies and video games.

Explore

Students will be introduced to real-world examples of AI technologies and video games to better understand the ways that new technologies are helping the world. Students will also look at AI developments with a critical lens to determine ethical practices in the use of data in AI systems.

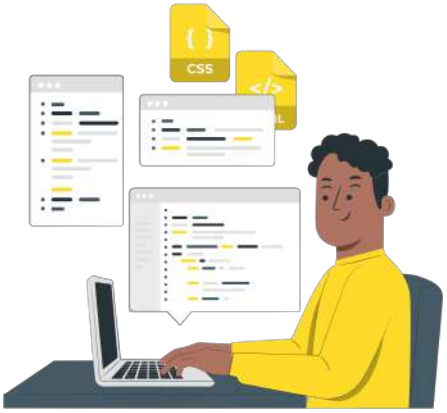
Learn

Teachers will lead students through 5 Guided Projects that teach more advanced concepts in JavaScript, like using a database to store and retrieve data. Learn how to program using advanced JavaScript libraries for gaming like Phaser and how to make use of machine learning libraries for image recognition. Gain an understanding of how AI and machine learning systems work.

Create

Students will create 5 unique projects throughout the course. At the end of the course, students will be asked to customize a project of their choice based on the 2 project briefs that are provided. Each of the projects will be customizable and can be shared using a public URL or QR code.

Project	Description	Duration
Endless Runner Game	Build a classic side-scroller game using the Phaser library and learn how to use Phaser functions. Along the way, learn how video game designers implement intuitive game play as a design practice.	8 hours
Space Adventure Game	Build an interactive game that uses Phaser library functions that make game creation easier. Explore how professional game designers approach game design development.	4 hours
Space Jumper Game	Make a character jumping game that uses physics to simulate gravity and check for collision between the player and the platforms. Explore how game designers plan for game advertising and marketing.	8 hours
AI in Music	Using the Magenta JavaScript library, create a custom beat loop maker. Explore how musicians and engineers are creating music using a synthesis of AI and real instruments.	6 hours
AI in Art	Design an app that can transfer the style of a famous artist on to any image that you provide using the ML5 JavaScript Library. Explore how artists are using AI to generate digital and physical art.	8 hours
Capstone		
Endless Runner Game Sandbox	Elaborate on the Endless Runner game to include more obstacles and scenes. Work in Sandbox mode for unlimited creativity.	6 hours
Game Promotion Webpage	After making a new version of the Infinite Runner game, design a promotional webpage that can be used to advertise and share about the game.	6 hours



Code Is: Your Voice (Beginner)

5 Hours

This introductory course allows students to use code as a way to share what is important or interesting to them. All of the projects in this mini-course provide ways for students to either follow along in the lesson or create their own unique projects, all while learning to program in HTML, CSS and JavaScript. Students are guided through the experience with video tutorials, live coding and access to the BSD code glossary. This course is also a great resource as a primer for educators to learn the basics of HTML, CSS and JavaScript that will prepare them for teaching with other BSD courses.

Explore

Students will be introduced to coding through projects that allow them to share their unique voices and interests. By focusing on content creation, students will have the opportunity to reflect on their own ideas to design customized projects.

Learn

Each of the guided projects is aided by video tutorials that walk through each step of the coding process, allowing for an easy transition into coding with HTML, CSS and JavaScript.

Create

Students will create 5 unique projects throughout the course. The projects increase in difficulty and range of customization, ultimately allowing for code to become “your voice”. Each of the projects can be shared using a public URL or QR code.

Project	Description	Duration
The People Who Inspire Me	Build a simple web page showing the top 3 people who inspire you while learning introductory skills in HTML and CSS.	1 hour
My Favorites Website	Expand on using CSS to create and enhance a simple web page telling us your 3 favorite things.	1 hour
Trivia Game Maker	Build an interactive trivia game and make your own trivia questions. Along the way, learn to start using JavaScript to make interactive web pages.	1 hour
Jokes and Riddles	Using JavaScript, build a set of cards that flip to reveal the answer to your favorite jokes or riddles. Customize the questions using HTML and CSS.	1 hour
Support My Cause	Learn the basics of how to store data in a database using JavaScript to build a landing page to collect the email addresses of supporters of your favorite cause.	1 hour
Bonus Projects	*no video tutorials	
Animated Text	Learn more about CSS to create an animated text object with your name or any other text.	1 hour
Robot Builder	Build a robot costume changer and customize the images to make your own unique robot designs.	1 hour

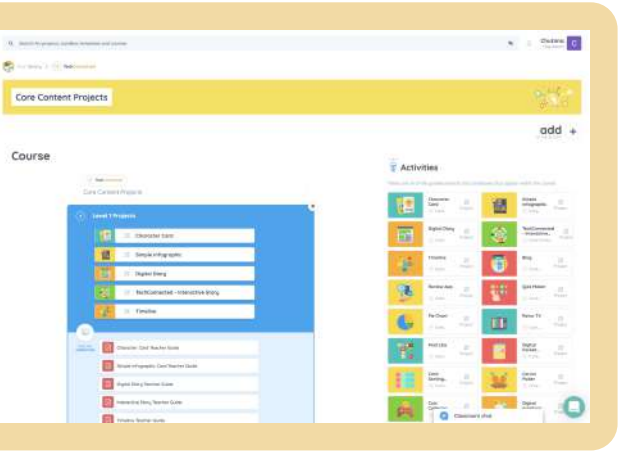
TechConnected

TechConnected is made up of 18 guided projects that are designed to be adapted to any subject, allowing students to customize and focus on content creation.

Each TechConnected project can be completed in between 45-90 minutes depending on how students customize the content.

Tech Ready | Tech Connected | Tech Novators | Tech Future

Projects guide students through the creation of useful tools like a blog, pie chart, digital diary and other types of creative media with an emphasis on enhancing, sharing and demonstrating what they have learned in different subject areas. For example, students can make a blog related to their Social Studies and Language studies or make an infographic and data analysis related to Science. Along the way, students will gather experience in coding using HTML, CSS and JavaScript. At the end of each project, students can export to Sandbox for further customization or share outputs with classmates, friends and family with a public URL.



We provide a Teacher Guide for each project that gives tips on how to customize the content for different subjects and how to customize the projects for further use. TechConnected projects can be used anytime and do not follow a defined progression. Projects are labeled as Level 1 for beginners, Level 2 for intermediate learners and Level 3 for advanced learners.

*Project descriptions can be found on BSD Online.

Level 1 (Beginner)	Level 2 (Intermediate)	Level 3 (Advanced)
Meme Maker	Story Maker	Card Sorting Filter
Poem	Blog Maker	Carrot Picker
Character Card	Review App	Coin Collector Game
Simple Infographic	Quiz Maker	Digital Assistant
Digital Diary	Pie Chart	
Timeline	Retro TV	
	Mad Libs	
	Digital Pocket Guide	

TechConnected

Course Descriptions

Project Level 1 (Beginner)	Description
Poem	Learn how to format a poem in any style using HTML. When you're finished, you'll have a one-of-a-kind page that can be shared with family and friends.
Meme Maker	Design your own meme with a custom image and text. Along the way, learn how HTML and CSS are used together.
Character Card	Create a simple Character Card that shows the character name with an image. Students will also add character attributes like "likes" and "dislikes". After students complete the project, it can be customized in Sandbox.
Simple Infographic	Create a simple infographic using HTML and CSS to present your research and findings or reflections on any topic. This project can easily be adapted to share information on any subject with three subsections.
Digital Diary	Build a digital diary using HTML and CSS to practice expressing yourself. You can make a diary about your own experiences or choose a character from fiction or history.
Timeline	Make a horizontal timeline of events using HTML and CSS. This project is designed to be viewed on a mobile device and can be customized to include more events.
Project Level 2 (Intermediate)	**Description**
Story Maker	Build a story maker using a combination of logic, JavaScript conditionals, and creativity to make an organized story tree. Make a short story in the Guided Project or add more scenes in the sandbox to expand the story.
Blog Maker	Make your own blog with images and descriptions using HTML and CSS. You can create custom themes and blog about your favorite interests and adventures.

Project Level 2 (Intermediate)	Description
Review App	Create a book review app using HTML and CSS to write an introduction to introduce your app, along with 2 reviews of any book of your choosing.
Quiz Maker	Build a multiple choice trivia game that can be used across a variety of topics using HTML and JavaScript! You can easily add more questions to the trivia game after completing the project.
Pie Chart	By using HTML and JavaScript, make your own pie chart. In this project, you will learn how to use a JavaScript array to visualize data. Once you learn how to add the data, you can customize the pie chart with new sections.
Retro TV	Learn how to design a retro-style television with animated GIFs using HTML, CSS and JavaScript. Customize the project with your own GIFs and add multiple channels.
Mad Libs	Build a digital Mad Libs style story using HTML and JavaScript. Practice using a wide range of vocabulary elements in a fun way that allows for creative storytelling.
Digital Pocket Guide	Learn how to make a digital field guide of rocks using HTML, CSS and JavaScript. Customize the projects by adding your own images, descriptions and titles.
Project Level 3 (Advanced)	**Description**
Card Sorting Filter	Create a card sorting filter that displays cards in different categories. Learn how to use lists in HTML and how to style the lists in CSS.
Carrot Picker	Learn how to build a "whack-a-mole" style game using HTML, CSS and JavaScript. Learn to set up a scoring system and how to customize the characters.
Coin Collector	Learn to make a coin collector game using Phaser, a JavaScript framework for designing games. Customize the game with your own player, background and items to collect.
Digital Assistant	Learn advanced skills in JavaScript like making arrays and how to combine strings and variables through concatenation to make a personalized digital assistant.

TechNovators

TechNovators courses are designed to be used in out-of-school time environments like camps, clubs, afterschool programs, summer enrichment and other similar uses. Each course is up to 25 hours and explores themes like, website development, game development, App Development, VR and even AI.

Each course is centered around a series of guided projects that students work through to learn new digital skills. Once the guided projects are completed, students can customize their projects and share them as a portfolio of work. Along the way students will learn additional skills in design thinking, computational thinking and digital citizenship.

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TechNovators
Course Descriptions

Course Name	Description
First Steps in Coding Beginner	Gain an understanding of HTML, CSS and JavaScript and get a solid head start in website development! Using real-world technology, students will create websites and web-based applications. They will build their own coding posters, trivia games and personalized websites. **Explore** coding concepts that are needed for basic web development and uncover the different elements of a simple web page. **Learn** the fundamental languages HTML, CSS & JavaScript used to develop web pages and websites. By using a simple structure for a web page, learn how to take an idea online. **Create** a variety of simple projects, including a personal portfolio of posters, websites & trivia games. Each of the projects, once finished, can be shared online with friends.

Project	Description	Duration
Eye Chart	Learn how to create your own eye chart using HTML and CSS!	2 hours
Online Poster	Learn how to create a digital poster using HTML and CSS. Customize the poster with your own images, and text.	3 hours
Pattern Art with Code	Learn more about HTML structure and CSS properties to create a colorful art pattern.	3 hours
My First Website	Create a single-page website about your hobbies and interests using HTML and CSS.	5 hours
Chatbot Conversation	Learn how to use JavaScript to program a chatbot that can have a dynamic conversation with users.	5 hours
Trivia Quiz	Create a trivia quiz game using JavaScript. Learn about conditional statements and add your own quiz questions.	5 hours
Debug my Website	Use debugging skills and computational thinking to identify and correct code errors in HTML and CSS.	1 hour
Debug my Trivia Quiz	Use debugging skills and computational thinking to identify and correct code errors in JavaScript.	1 hour

Course Name	Description
First Steps in Game Development Beginner	This course is the perfect introductory experience for learning digital skills in the world of gaming and programming. Students will learn how to plan, design and develop their very first web based game using HTML, CSS and JavaScript. They will pick up valuable skills along the way such as planning, designing game assets and creating digital special effects.  **Explore** the magical world of code by making several unique mini-games and see how games are designed for online play.  **Learn** fundamental skills in HTML, CSS and JavaScript to develop web-games and learn to animate characters and creatures for in-game elements.  **Create** 5 different mini-games that have characters and game elements that can be customized.

Project	Description	Duration
Witch Room	Learn how to use HTML, CSS, and JavaScript to create an “item collection” game.	6 hours

Project	Description	Duration
Potion-Matching Memory Game	Build a card-matching game while learning how to create the layout and interaction using HTML and JavaScript.	4 hours
Flying Broom Game	Build a “click and collect” game by learning how to position objects and code the interactions using HTML, CSS and JavaScript.	4 hours
Spellcasting Game	Learn how to use HTML and JavaScript to create this “text-based combat” game.	4 hours
Potion-Maker Game	Learn how to position items and images by using HTML and JavaScript in order to create this “drag and drop” combination game.	7 hours

Course Name	Description

Code the Future with Artificial Intelligence
Advanced

From self-driving cars to entertainment recommendations, AI is a part of our future. There is no better time to start learning how AI works.

Students will use Machine Learning and code to develop and train their own vision recognition system and explore how Machine Learning can be applied to art, music, games and digital assistants by making and programming AI projects.

Students will also explore similarities between AI and how our own minds by studying the effects of bias and categorization of data.

Explore the AI technology behind modern vision recognition systems, digital assistants, chatbots and other AI tools.

Learn to design and program AI tools using JavaScript and HTML.

Create a fully-responsive vision classifying tool, a chatbot and a smart assistant.

Project	Description	Duration
Webcam Image Classification	Explore an AI tool that uses your webcam to classify images.	3 hours
Card Sorting Activity	Sort objects into different groups based on the label provided.	3 hours
Machine Learning - Image Classification	Explore uploading images to an AI tool that can be trained to identify labels and classes.	4 hours
Image Upload Classifier - Coding Project	Learn to build an image classifier AI project using HTML and JavaScript along with the ML5 library for Machine Learning.	4 hours

Project	Description	Duration
Webcam Live Classifier	Explore using live webcam data to capture images for an AI tool that can be trained to identify labels and classes.	4 hours
Webcam Live Classifier - Coding Project	Learn to build a webcam image classifier AI project using HTML and JavaScript along with the ML5 library for Machine Learning.	4 hours
Adjustable Accuracy Webcam Classifier	Explore how the KNN AI algorithm can be adjusted to fine-tune the results of the classifier.	4 hours
Responsive Instrument	Train a machine learning tool to recognize three classes of objects using your webcam. Each class will play a sound when classified.	3 hours
Music Generator	Using HTML and JavaScript, learn to build an AI tool that can recognize three classes of objects using your webcam. Each class will play a sound when classified that you can customize.	3 hours
AI Chess Player	Learn how to build an AI chess game using HTML and JavaScript. Then see if you can win against the AI!	2 hours
AI Digital Assistant	Create a JavaScript program that collects information from the user and uses it to have a dynamic conversation.	2 hours
AI - Animal Rescue	Build a path-finding AI that can determine the fastest path to a location, using HTML and JavaScript.	2 hours
AI - Navigation Algorithm	Learn how to code an algorithm that is needed for an AI powered self driving car.	2 hours
AI - Auto Navigation	Build and test an AI self-driving car using HTML and JavaScript.	2 hours
AI - Find the Finish Line	Build a self-driving car course and test the ability of the AI to complete the course.	2 hours

Course Name	Description
Mobile Game Developer Intermediate	In this intermediate course, students will learn to use HTML, CSS, and JavaScript to build games that can be played on both desktop and mobile devices. This course is designed for students who have had prior experience with HTML, CSS, andJavaScript.Using the BSD Online learning platform, students will build a total of five different games — a platformer, a trac game, a nonogram puzzle game, a battle game, and a jumping game. Students will develop fundamental skills in programming, learn about game development and design, and explore how to add further customizations to their projects.They will end the course with a tech portfolio of the projects they've created, and will be able to use their new skills to move onto more complex projects in the future.  **Explore** Students will further develop their understanding of HTML, CSS, and JavaScript by working through a progression of five game projects.  **Learn** Teachers will lead students through guided projects that teach the fundamentals of game development to create a series of projects on BSD Online. After completing the guided projects, students will also learn how to add further customizations to their projects in sandbox.  **Create** Students will create five unique projects throughout this course:

Project	Description	Duration
Platformer	Students will learn how to use HTML, CSS, and JavaScript to create a side-scrolling platformer where players jump to collect coins and avoid crashing into walls.	5 hours
Traffic Looper	Students will learn how to use HTML, CSS, and JavaScript to create a traffic game where players must complete successful loops around a track and control the speed of a car to avoid crashing into motorcycles.	5 hours
Nonogram	Students will learn how to use HTML and JavaScript to create a nonogram puzzle game where players must use the clues to reveal a hidden image.	5 hours
Dungeon Battle	Students will learn how to use HTML, CSS, and JavaScript to create a battle game where players must successfully defeat enemy monsters.	5 hours
Wall Jumper	Students will learn how to use HTML, CSS, and JavaScript to create a game where players jump to dodge falling rocks.	5 hours

Course Name	Description
Video Game Design with Phaser Intermediate	Start programming games like a professional with this course. Using the popular desktop and mobile gaming framework, PhaserJS, students will learn how to create a platformer game, a side-scroller game and mini-games. Engaging their creativity and design thinking skills, they will create, customize and enhance their games by adding their own set of characters, environments, gravity and world physics. Using Design Thinking methodology, students will gather feedback from classmates and iterate to improve their games.  **Explore** JavaScript-based video game development and play-test example games to understand best approaches for 2D game design.  **Learn** Platformer and side-scroller game design with Phaser and gain real-world game development skills. Learn advanced JavaScript concepts by programming game physics and multiple game levels.  **Create** a side-scroller 2D game that contains custom characters, backgrounds, levels and more. Once the game is completed, it can be shared online with friends.

Project	Description	Duration
The Linked Game (3 parts)	Learn how to use HTML and the JavaScript framework called Phaser to make an interactive puzzle-style game.	5 hours
Basketball Jam (7 parts)	Build an interactive two player basketball game where you can shoot a ball and play against another character using HTML and the JavaScript framework called Phaser.	10 hours
Burger Maker (6 parts)	Using HTML and the JavaScript framework called Phaser, build an interactive burger maker game where the player must prepare burgers with the right ingredients.	8 hours
Endless Runner	Customize the player, obstacles and scene of a side-scrolling video game using the Phaser framework. Students can design and customize their own elements.	2 hours

Course Name	Description
Build your Tech Startup Beginner	For aspiring technologists, this start-up course teaches students about cutting-edge new technologies to help them innovate a fresh new tech startup idea. Starting with fundamentals of technology, students will learn how programming works using HTML, CSS and JavaScript. Following this, students will identify a real-world problem that they would like to solve. Through design thinking activities and their newly acquired coding skills, they will design and prototype a working tech solution. Working independently or in small teams, students will then develop a business plan, company brand, and digital online presence. At the end of the course, students will have created a tech prototype, a business plan presented as a website and a business blog.  **Explore** new technologies that entrepreneurs use to develop business ideas using the same technologies that empower the major tech companies of today.  **Learn** the tools that entrepreneurs use to launch businesses, like design thinking, advertising, coding, marketing and brand development.  **Create** a single-page website to learn HTML, CSS and JavaScript, then prototype a business website and a digital portfolio that can be shared online. Use what you learn to launch your own business.

Project	Description	Duration
Technology of the Future	Students will explore emerging technologies like AI, VR and Robotics to help them think of technology themes that could be applied to a business startup idea.	2 hours
Business Brainstorm	Students will explore business ideas and begin to develop their own startup by planning out the necessary elements on a webpage.	4 hours
Business Branding	Students will develop a brand profile for their business startup, including a business logo, mission statement, slogan and a color palette.	4 hours
Business Website	Students will develop a multi-page website for their startup that includes the element from the Business Branding project.	5 hours
Business Advertising	Students will learn about business marketing practices and make a blog advertisement that can be shared on the Multi-page Website.	5 hours
Business Pitch	Students will learn about how to present a startup pitch and deliver a final presentation of their business idea, website and blog.	5 hours

Course Name	Description
Code Your Own World with VR Advanced	From forests to Mars, students will bring their imaginations to life by coding their own virtual reality world. Developed with HTML, JavaScript, and A-Frame, they will code and add their own customized textures, elements and interactions to complete their realistic simulated 3D environments. Students will also be able to easily share their work with friends and families, as well as immerse themselves into their creations.  **Explore** how developers assemble and approach the design of virtual reality worlds and explore how professionals consider elements like, placement, backgrounds, settings and genres.  **Learn** the fundamentals of A-Frame along with HTML, CSS and JavaScript to customize textures, elements and virtual interactions. A-Frame is a professional framework for designing and coding virtual experiences.  **Create** VR scenes with custom themes, animations, gaze controls, and textures. Students will work through a progression of 13 projects, with each one teaching a specific feature of the A-Frame framework. As a final capstone project, students will then apply what they have learned in the guided projects to create a custom scene of their own in the sandbox.

Project	Description	Duration
Set up A-Frame	Students will be introduced to the syntax for A-Frame and learn how to import the A-Frame framework into a project. Students will then create a simple 3D scene and populate it with geometric shapes.	2 hours
A-Frame Modeling	Students will learn to create complex shapes by combining and manipulating simpler shapes to create the double-helix structure of a DNA molecule.	1 hour
A-Frame Image Textures	Students will learn how to apply images as textures to make 3D objects look more realistic.	1 hour
A-Frame Lighting and Fog	Students will learn how to add different types of lighting to a scene to create ambiance.	2 hours
Import Third-Party Models into A-Frame	Students will learn about the asset management system in A-Frame to import a third-party 3D model from Sketchfab.	2 hours
A-Frame Animations	Students will learn and apply the concept of animation keyframes to animate a car driving around a city street.	2 hours
A-Frame Path Animations	Students will learn how to animate objects that follow a predetermined path using curves and control points to animate a roller coaster art moving along a track.	2 hours

Project	Description	Duration
A-Frame Physics	Students will learn how to simulate physics in a scene by creating an animated scene of various sports balls rolling and bouncing off a flight of stairs.	1 hour
A-Frame Collision Detection	Students will learn how to program collision detection objects by creating an animated scene of a car that can collect coins.	2 hours
A-Frame Custom Components	Students will learn how to make the code base of an A-Frame scene more readable and efficient by separating A-Frame code into HTML and JavaScript to create the animated blades of a windmill fan.	2 hours
A-Frame Gaze Interactions	Students will learn about VR gaze controls and interactions by creating a 3D button that is clickable by looking at it.	1 hour
A-Frame VR Tour	Students will learn how to instantly change the position of the viewer by creating a scene with multiple waypoints to which the viewer can teleport to by looking at it.	1 hour
A-Frame Sound Effects	Students will learn how to add audio to an A-Frame scene to play a series of sound effects.	2 hours
Final Project: Diorama	Students will apply what they have learned in the 13 projects to create a VR scene of their own as the final project of this course. For this project, students will not use a guided project. Instead, they will be creating their diorama from a sandbox on BSD Online. OPTIONAL: Students can present their VR diorama at the end of the course.	4 hours

Course Name	Description
Remake Classic Games with Scratch Beginner 25 hours	Get a great introduction to programming with the new and improved version of Scratch. Students will learn the basics of game design and character animation in a well-structured and easy-to-learn environment as they reimagine classic arcade games, such as Tetris and Flappy Bird. What's more, they will learn to make art with code using the new code blocks in Scratch. No previous experience is required for this course.  **Explore** how popular arcade games became famous, how they are programmed and how to recreate them with Scratch.

Learn about the essentials of game design and character animation using Scratch. With inspiration from classic games, make your own updated versions.

Create a variety of 2D arcade games with animated characters, including coin collectors, maze hunters and side scrollers.

All projects are 1 hour in duration

Project	Description
Maze Game	Design a simple maze game and learn about sprite control.
Animations	Learn to animate characters and sprites that can be added to any game.
Ball Shooter	Build and customize a ball-shooting game that keeps score.
Character Adventure	Make an animated character adventure game.
Geometric Art	Design geometric art with the Scratch pen tool.
Pong	Learn how to build and play the classic game of pong.
Coin Collector	Make a coin collecting game with custom sprites.
Racing Game	Build a racing game with multiple variables.
Tetris	Remix a version of the classic hit game, Tetris.
Classic Game Maker	Build your own custom game in the style of the classics.
Flappy Parrot	Learn about the program and controls of the game and then remix a version.
Space Shooter	Build a space themed projectile game.
Snowball Physics	Make a game that simulates gravity for perfect snowball throwing.
Splash Screens	Learn to build an intro splash screen for your game.
Action and Adventure Game Maker	Make a custom Action and Adventure game.

Project	Description
Catch the Ghost	Remix a version of a ghost catching game and add your own sprites.
Text Input Game	Build a game that uses text-input to play and receive commands.
Boat Race	Make a boat race game that follows the mouse pointer.
Multi-level Game	Make a game that has multiple levels of difficulty.
Football Goalie	Remix a version of a football goalie game and customize it with new sprites.
Sprint Game	Build a sprint game that requires keyboard input for controlling speed.
Archery	Make an archery shooting game that follows a random sprite on a target.
Table Football Game	Build a table football game for two players.

Course Name	Description
3D Game Design and Development with Roblox Beginner 25 hours	Students will use the world-famous gaming platform, Roblox Studio, to design and develop their own games. They will use programming logic like function, loops, and conditions to customize and develop an engaging story that captures the player's interest, and design heroes that take on the interactive world. Students will work on their game design skills and learn to think creatively about designing worlds, creating themes and setting objectives and goals, mimicking how professional developers.  **Explore** how other creators have developed advanced games using Roblox and see how Roblox games are made from start to finish.  **Learn** to design and develop fully interactive 3D games using Roblox Studio and Lua programming.  **Create** a custom 3D game using Roblox. Develop unique characters and scenes that can be shared and played by friends. **All projects are 1 hour in duration**

Project	Description
Fundamentals	Explore the fundamental concepts of building games using Roblox Studio and plan out a 3D adventure game.
Effects & Advanced Functionality	Learn how to add animated visual effects and create game checkpoints that will be added to the 3D adventure game.

Project	Description
Environmental Design	Learn how to model and customize environmental features in Roblox Studio while designing a 3D adventure game.
Lua and Game Programming	Learn how to program using the Lua coding language to add interactivity to the 3D adventure game.
Cool Tricks with Scripting	Learn about variables, functions, and conditional statements using Lua to further customize the 3D adventure game.

Course Name	Description

First Steps in Python
Beginner
25 hours

In this introductory course for beginners, students will learn the basics of coding in Python. The course will focus on learning Python syntax, structure and parameters and then use the knowledge and skills to build two projects

Using the BSD Online learning platform, students will be guided through learning about Python basics like, variables, data types, conditional logic, math operators and loops. The first part of the course is designed to be self-guided with activities and practice with syntax and using the console. Then students will build a birth-date-to-now calculator and an encoder/decoder.

They will end the course with a tech portfolio of the projects they've created throughout the course, and will be able to use their new skills to move onto more complex projects in the future.

Explore Students will develop a fundamental understanding of the basic programming concepts in Python by working through a progression of 18 lessons and two projects.

Learn Students will be self-guided through a series of lessons and guided projects that teach the fundamentals of Python. After completing the lessons and guided projects, students will also learn how to add further customizations to their projects in sandbox.

Create Students will create 4 unique projects that put their Python skills to use: Rock-paper-scissors App. Countdown Timer, Birth-date-to-now Calculator, Secret Message Encoder/decoder.

All projects are 1 hour in duration

Project	Description
Intro, Comment and Variables	Learn about the python environment, basic syntax and about code comments.
Data Types	In Python, students will learn about the various data types and their function.
String Functions	Learn about the function and use of many different types of "strings" and how they are used in Python.
Math Operator	Learn how to program and use math operators to perform basic arithmetic and assignments.

Project	Description
Conditional statements	Learn to write Python programs using all of the conditional statements and logic operators.
Project 1	Students will make a Rock, Paper Scissors app using conditional logic.
Loops	Learn how to use loops in Python and write example programs.
Project 2	Make a countdown timer using your knowledge of loops.
List	Learn about the use and function of lists and how to incorporate them into your programs.
2D List & Nested Loop	Make a 2D list and learn how nested loops can be used effectively.
Functions	Define a function and learn to use a function and its parameters.
Functions (recursion)	Learn about the special use of recursion in functions.
Tuples	Learn to create, access, update and use “tuples” in Python.
Sets	Learn to create, access, update and use “sets” in Python.
Dictionary	Learn to create, access, update and use “dictionary” in Python.
Project 3	Build a console based application - let the user input their birth date and print out how long they have been living on the planet Earth (years, months, days)
HTML Elements with Brython	Create and use HTML elements with Python.
Styling Elements	Learn to change the background-color, font and CSS elements.
Event Handling	Learn about “events” to add interactivity to a program or project.
Project 4	Build a GUI based secret message encoder and decoder application.
Teacher PD Project	Learn the basics of Python, how Python is used in the browser and other environments and how Python requires the use of the Console.

Course Name	Description
Introduction to Blockchain Programming Advanced 10 hours	This course is for students who have an intermediate level of JavaScript programming and want to learn how blockchain systems work and why they are preferred to reduce online security risks. We will explore how blockchain technologies are changing the way we share information, make payments with crypto currencies and keep track of transactions via a digital ledger. By the end of this course, students will build a simulated blockchain wallet system to store coins. This course emphasizes on both the front and back end of developing blockchain solutions.  **Explore** how blockchains are already being used in different industries and how blockchain technologies are used for crypto currencies and NFTs.  **Learn** the basics of how blockchains work and how to code and program a blockchain.  **Create** a simulated blockchain wallet system and test the security of the blockchain.

Project	Description
Introduction to Blockchain Technology	Welcome to Blockchain Programming An introductory slideshow presentation that provides background information on how blockchains are already being used in a variety of industries.
	What is Blockchain? An introductory slideshow presentation that explains the main elements and key vocabulary of learning about blockchain technologies.
	Blockchain Simulation Explore and tinker with a blockchain application and test the security of it.
Hashing Algorithms: SHA-256	Hashing Algorithms: SHA-256, What is it? An introductory slideshow presentation that explains what a hashing algorithm is.
	SHA-256 Hash Generator An interactive guided project to create the frond and back end of a hash generator.
JavaScript: Classes and Objects	Introduction to Object-Oriented Programming An explanatory slideshow presentation that prepares students for advanced JavaScript programming.
	JavaScript - Class and Object An interactive guided project to learn the most fundamental concepts of object-oriented programming (OOP for short) – classes and objects.
Blockchain Simulator	BSD Online: Blockchain Simulator An introductory slideshow presentation that explains the objectives of programming the simulator project.

Project	Description
	What is Blockchain Mining? An explanatory slideshow presentation that describes how blockchain mining works.
	Blockchain Simulator: Part 1 (User Interface) An interactive guided project to build the front end elements of the blockchain simulator.
	Blockchain Simulator: Part 2 (Logic and Behavior) An interactive guided project to build the back end elements of the blockchain simulator.
Crypto-currency Wallet	What is Cryptocurrency? An introductory slideshow presentation that explains some background information on cryptocurrency and its uses.
	Cryptocurrency Wallet: Part 1 (User Interface) An interactive guided project to build the front end elements of the wallet.
	Cryptocurrency Wallet: Part 2 (Login System) An interactive guided project to build the log-in elements of the wallet.
	Cryptocurrency Wallet: Part 3 (Transactions) An interactive guided project to build the transaction process of the wallet.
	Cryptocurrency Wallet: Part 4 (Mining) An interactive guided project to build the mining process of the wallet.

Course Name	Description
Introduction to Web3 Beginner 10 hours	In this course, students will learn about the emerging technologies that are powered by Web3. Students will explore how Web3 has shifted the way that the internet works, allowing for new technologies like cryptocurrencies, digital assets, blockchains, NFTs and the metaverse. By the end of the course students will generate their own NFT art, create their own cryptocurrency and learn how they can interact with it using a digital wallet, a smart contract and cryptocurrencies, all in a safe and simulated environment.  **Explore** how Web3 technologies are currently being used with Cryptocurrency and NFTs.  **Learn** how Web3 technologies work and how to design a pixel-art style NFT character.  **Create** a new cryptocurrency, a unique NFT artwork and interact with it using a simulated crypto wallet.

Project	Description
Room Decorator	Students will create a game where players can use a simulated cryptocurrency to purchase furnishings to decorate a room.
Start a New Crypto-currency	Students will design a logo to showcase a simulated cryptocurrency and make a graphic to share the logo.
My Crypto-currency Website	Students will build a website for the fictional cryptocurrency created in the “Start a New Cryptocurrency” project.
Web3 - Blockchain Simulator	Students will learn the basics of blockchain technologies and create a visual representation of a working blockchain.
NFT Pixel Art Maker	Students will learn about NFTs and create three pixel-style art drawings to be used as NFTs.
NFT Art Gallery	Students will build a webpage to showcase the pixel-style art drawings created from the “NFT Pixel Art Maker” project.

TechFuture

The TechFuture program is designed to give students, ages sixteen plus, a chance to explore how technology has transformed different digital industries.

Students will apply the learning by building real-world projects using industry standard tools.
The six courses cover topics in design, programming, data analysis and organization, as well as digital marketing. Students will apply skills within a range of industry themes and job activities to expand their understanding and opportunities of where their own greatest interests lie related to the world of professional digital industries.

Each course is 40 hours and can be done together in the recommended order (240 hours), or individually. The courses are designed to give students opportunities to practice their skills, project management, as well as communication, digital literacy and digital citizenship. This programme is essential to the modern workplace.

Tech Ready Tech Connected Tech Novators Tech Future

TechFuture
Course Descriptions

Course Name	Description
Digital skills: Modern industries and the workplace	In this course, students will gain understanding of and begin to practice the identified core skill areas of the program: Design, Programming, Data and Digital Marketing across different industries, such as finance, education, and hospitality. The course celebrates entrepreneurship, focuses on how to succeed in their (future) workplace and in the identified core skill areas through learning tools and techniques, developing best practices in a digital work environment. **Explore** the role of digital design, data, programming, and marketing across different industries. **Learn** the fundamental core digital skill areas in the future of work across different industries. **Create** digital artifacts (presentations and infographics) by using common, industry-standard digital tools to articulate their understanding of digital best practices in the workplace.
Digital Design: Fundamentals in UI and UX	In this course, students will dive into the world of functional design by having a deeper understanding of how design decisions are made. They will study User Experience (UX) through various user perspectives and use industry standard tools. **Explore** how basic design principles inform user interface (UI) and user experience (UX) design.

Learn to implement Design Thinking, evaluate the UX of digital applications, plan the UX of digital products (app and websites) and prepare evidence to support design decisions.

Create wireframes, mock-ups, and prototypes by using industry-standard design tools.

Programming: Build an E-Commerce Website

In this course, students will gain confidence in CSS and JavaScript fundamentals. They will apply their learning to ultimately create a prototype of an e-commerce website using the BSD Database on BSD Online.

Explore the best practices of web development in the context of an e-commerce website.

Learn how to utilize CSS and JavaScript to manipulate the front-end and back-end, as well as databases of a website.

Create a front-end and back-end prototype of an e-commerce website.

Data: Actionable insight

In this course, students will learn how to work with data and how data is utilized in businesses. Students will also learn the implications of working with big data sets and analyze data to produce insight.

Explore the power of data and how different industries utilize data to inform their business decisions.

Learn how to collect and organize raw data to produce informative data visualization and insight.

Create a comprehensive data report including visualizations to provide actionable insights for a business.

Digital marketing: How to Get the Right Exposure for Your Business

In this course, students will explore the key principles and strategies in digital marketing. Students will learn the process, tools and components to launching a digital marketing campaign.

Explore how social media digital marketing is used across different industries.

Learn how social media, design, and data come together to inform an effective digital marketing campaign.

Create a comprehensive digital marketing campaign plan for a given client brief.

Entrepreneurship: From an idea to action

This course is designed to summarize the learning from the previous courses to see how skills in design, data, marketing, programming and leadership can come together to realize their entrepreneurial ideas.

Explore entrepreneurial concepts and strategies in taking an idea and transforming it into a business plan.

Learn how to build a business plan and proposal by implementing skills and learning from the previous courses.

Create a digital prototype, a design proposal, a data report and a digital marketing campaign to rationalize, communicate and promote a new product or service of their own creation.