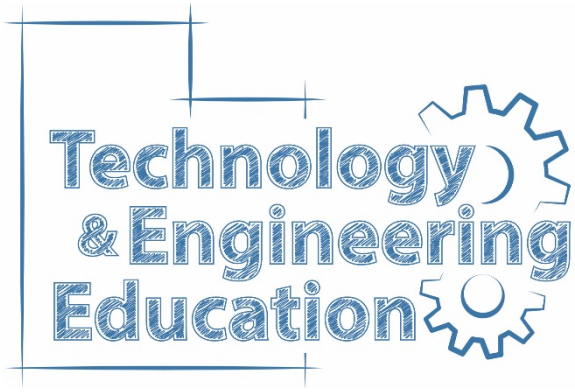
STRANDS AND STANDARDS

INFORMATION & COMMUNICATIONS TECHNOLOGY



Course Description

An introductory course focused on digital technologies and what it means to be living in a digital world. Students will gain an understanding of how digital technologies impacts the environment, society, and the economy. Students will develop a foundation in essential abilities and attitudes that will in turn expand their opportunities in the world of information and communications.

Core Code	38.03.00.00.040
Concurrent Enrollment Core Code	None
Units of Credit	0.5
Intended Grade Level	9
Prerequisite	None
Skill Certification Test Number	None
Test Weight	None
License Type	Secondary Education 6-12
Required Endorsement(s)	Technology & Engineering, or
	Technology
	Introduction to Information Technology

STRAND 1

Students will follow safety practices.

Standard 1

Identify potential safety hazards and follow general laboratory safety practices.

- Assess workplace conditions regarding safety and health.
- Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite.
- Locate and understand the use of shop safety equipment.
- Select appropriate personal protective equipment.

Standard 2

Use safe work practices.

- Use personal protective equipment according to manufacturer rules and regulations.
- Follow correct procedures when using any hand or power tools.
    - Ref: https://schools.utah.gov/cte/tech/publicationsresources under the Safety Program and Management tab.

Standard 3

Complete a basic safety test without errors (100%) before using any tools or shop equipment.

STRAND 2

Students are introduced to the history, application and safe use of communications technology. They will also explore how we have moved from an analog to a digital world.

Standard 1

Analyze the historical impacts of communications technology and compare with contemporary applications.

- Define Communications Technology.
- Create an outline of the history of communications and make inferences to the future.
    - Identify five historical figures, places and major historical events in communication history.
    - Explain the impact that a specific event, person, or communications technology has had on society, either locally, nationally, or globally.
    - Compare and contrast the history of communications with current events.
- Explore the impact on society and world.
    - How communication (even entertainment) can shape perceptions of present and past issues.
    - Ways in which communications is used.

Standard 2

Students are introduced to the communications model.

- The Communications Model.

- Message
- Encoder
- Transmitter
- Receiver
- Decoder

(This could also be presented with the Systems Model: input, process, output, feedback)

Standard 3

Students are introduced to the concepts of networks and how they are used to communicate.

- Analog Network Paths - highways, trails
- Network Protocols - Packets
- Internet as a large network
- Text communications - letters, email, SMS (texting), Instant Messaging (IM)
- Voice communications - phone, cell, VoIP
- Video Communications - Skype, Facetime, Google Hangouts, Webinars, etc.
- Cloud Services - data centers, online office suites, cloud drives, etc.

Standard 4

Students are introduced to the safe use of equipment and Internet safety.

- Equipment instruction, demonstration, and rules.
- Internet safety, identity theft, passwords and etiquette.

STRAND 3

Students are introduced to the basic skills of using files and folder management. The will also explore the concepts dealing with intellectual property.

Standard 1

Learn and use basic operating systems functions, the use of files and folders.

- Opening programs and menu structure
- File types and extensions
- Saving files

Standard 2

Learn about of copyright and its use.

- Downloading pictures and music
- Understand Fair-Use laws
- Understand plagiarizing literary and artistic work

STRAND 4

Students are introduced to graphic design, measuring, and the production of graphics.

Standard 1

Learn the different measuring systems used in the Graphic Industry.

- Understand the differences between the Metric vs. standard measuring systems.

- Understand the use of scale, pica and points, and resolution.

Standard 2

Learn the design process and create different types of graphics.

- Understand the design process.
  - Understand Elements and principles of design.
  - Understand vocabulary of graphic production.
- Create and use different types of digital graphics.
  - Vector and raster graphics.
  - List graphic skills for life.
  - Explore career graphic skills.
- Use graphic design software (emphasis on alternate software to Illustrator or even iPad).

Standard 3

Produce a variety of graphics. (Varied by equipment and resource availability)

- Produce graphics in a couple of different ways:
  - Laser engraving
  - Vinyl cutting
  - Screen printing
  - Heat press
  - Package design
  - Button makers

STRAND 5

Students are introduced to several ways the communications and art are developed in a digital world.

Standard 1

Work with and modify digital sound files.

- Understand the transition from analog sound to digital sound.
- Record sound using a computer, phone or other digital device.
- Edit a digital sound file (Audacity).
- Add effects of sound to produce mood.
- Create original music with software (GarageBand or Acid).
- Editing digital music (Audacity).
- Use digital sound in a project.

Standard 2

Work with and modify digital photos.

- Understand the transition from film to digital photograph.
- Take photos with a digital camera or phone.
- Transfer pictures to a computer via USB, SD card, or wirelessly.

- Preform simple photo editing.
    - Selection tools
    - Drawing tools
    - Graphic creation
- Perform complex photo manipulation.
- Print photos compositions.
- Use digital photos in project.

Standard 3

Create different kind of animations.

- Understand the transition from drawing animations to digital animation.
- Give a basic definition of animation and how it works.
- Understand basic animation principles (Simple introduction could be done with Scratch).
- Explore different types of animation.
- Create a stop-motion animation using flipbooks, clay, or Legos.
- Use frame-by-frame animation (Pivot).
- Use keyframe animation (This could be done with Flash, Premiere, AfterEffects, AnimeStudio, Scratch, Wideo, or even PowerPoint.).

Standard 4

Learn the process of video production and the manipulation of digital video.

- Understand the change from film movies to digital video production process.
- Create a storyboard and script for a short video.
- Understand and use camera movement, style, and shots.
- Use a digital video camera, phone, or device to create a digital video.
- Edit the video to include other media (sound, graphics, etc.).
- Publish the video project.

Standard 5

Explore the process of web design and create a basic web site.

- Design a simple website with wireframes or storyboard.
- Understand the basics of HTML in web design.
- Create a simple website or HTML5 app (Weebly, LucidPress, etc.).
- Incorporate other digital components (graphics, sound, photos, video, etc.) in the website.
- Publish the Web/HTML5 project for other to view.

STRAND 6

Students will be introduced to software design, coding structures, and app development.

Standard 1

Explore the concepts of computational thinking, the software design process, programming structures, and programming languages.

- Understand the concepts in computational thinking.
    - Decomposition, algorithms, etc.
- Understand and use the software design process
    - Input, processing, output.
    - User interface design (UI)
    - User experience (UX)
- Understand and use programming structures.
    - Sequence programming
    - Decisions with if – then – else statements
    - Loops – repeat, for, while, etc.
    - Functions, modules, methods
    - Variables
- Understand and explore different programming languages.
    - Block type languages – Scratch, SNAP, Blockly, AppInventor, TouchDevelop, etc.
    - Text based languages – Alice, Processing, Python, Java, Javascript, C#, Bootstrap, etc.
    - Game engines – GameSalad, Game Maker, Gamestar Mechanic, etc.

Standard 2

Code a project(s) to create a game, story, application, or app.

- Work with a partner or team for the project.
- Plan and design a computer program or app.
- Choose one of the following categories for your program.
    - Story telling
    - Music and sound
    - Game
    - Simulation
    - Other with approval
- Code the program using an appropriate programming environment.
- Debug the program as needed.
- Publish the program or application that is developed.
- Understand connections to math and science.

STRAND 7

Students will explore the collection of data, information, online databases, and mapping.

Standard 1

Utilize online databases to explore the collection of data and information.

- Explore online databases.
    - Search engines – Google, Bing, Yahoo, etc.
    - Address books, real estate sales
    - Shopping – Amazon, eBay, etc.

    - Weather, news, gossip, etc.
    - Language translators, Duolingo, etc
- Use online mapping (Google maps, Google Earth, Bing maps, etc.).
- Understand online data collection.
    - Crowd sourcing -- Gas Buddy, Captcha, Duolingo
    - Wiki – Wikipedia, Commons Wikipedia, etc.
- Collect data using paper and pencil and Google Forms or Microsoft OneDrive Surveys.
- Analysis data geographical data using a program like ArcGIS Online.
- Explore colleges and careers using an online database (UtahFutures, etc.).

Standard 2

Explore the uses of bar and QR coding for a different purposes.

- Understand types of bar and QR coding.
- Understand how codes are used to identify data.
- Create and use QR and bar codes.
- Use a QR code and an URL shorteners.
- Participate in a QR or bar code project.

Standard 3

Learn what it means to live a citizen in a digital world.

- Understand what it means to be Digital Citizen in a Digital Society.
- Understand proper online ethics and behavior.
- Understand proper use of Social Media: Facebook, Twitter, Pinterest, Snapchat, Instagram, etc.
- Know how to prevent Cyber Bullying.
- Understand the difference between Private and public profiles and presence.
- Understand about online security, virus, threats, hackers, antivirus software, and encryption.
- Understand the proper uses of online media: Videos, YouTube, Vimeo -- Music, iTunes, Podcasts, TED Talks, etc.
- Explore online learning: YouTube, Instructables, MOOCs, iTunes U.

STRAND 8

Students will explore the world of how software and hardware interact to create robotics and other usefully functions in society.

Standard 1

Explore the use of robotics in society.

- Understand how society is effected by the use of robots and drones.
- Explore the use of robots in your community.
- Explore careers and skilled needed to create and use robotics.

Standard 2

Explore the use of microprocessor and how they can be controlled and interacted with software.

- Explore uses of Audrinos and Lillypads.
- Explain how Audrinos are programmed.
- Explore and list ways a Raspberry Pi's could be used.
- Explore how Makey Makey, Picoboards can be controlled.

Standard 3

Explore how all kinds of digital computing devices effect the world we live in.

- List all the computing devices you might use daily.
- Understand how phones and tablets are changing computing.
- List steps that might be used to solve a computer or software problem.

STRAND 9

Students will investigate career opportunities in the information & communications industry.

Standard 1

Identify occupations related to the digital world.

Standard 2

Identify different types of occupational training.