COURSE TITLE: Introduction To Programming

Course Description:

Introduction to Programming provides an understanding of basic computer programming concepts and logic. Programming will be introduced through a variety of projects and object-based programming activities and applications. Business-related skills such as teamwork and interpersonal skills will be a part of this course.

Potential Certifications/Credentials:

Adobe Certified Associate (ACA) – Photoshop / Dreamweaver / Premier Pro / InDesign / Illustrator, ASK Institute – Concepts of Entrepreneurship and Management / Fundamental Business Concepts, Certiport- Entrepreneurship and Small Business (must hold concentrator status), IC3 Global Standard 6 (or higher), Microsoft Office Expert 2019/365 - Access / Excel / Word, Microsoft Office Specialist 2019/365 (MOS) (Two of the following areas REQUIRED: Excel Associate / Outlook Associate / PowerPoint Associate / Word Associate)

Course Scope and Sequence

Unit #	Unit Title	Estimated Hours
1	Foundational Standards	
2	Programming and Development	
3	Web Design	
4	Customer Service and Leadership	
5	Career Opportunities	5
6	Computational Thinking	
7	Digital Culture	
8	Systems and Modeling	

Unit Plans of Instruction

Foundational Standards

Supporting–will be taught throughout the course as needed for the unit.

F1. Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and handling hazardous materials and forces.

F2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.

F3. Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.

F4. Advocate and practice safe, legal, responsible, and ethical use of information and technology tools specific to the industry pathway.

F5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.

F6. Discuss and demonstrate ways to value diversity.

Unit 2 Title: Programming and Development

Content Standards

1. Research differences and similarities among various programming languages.
2. Construct digital projects using a variety of object-based or language-based programming tools.
3. Gather information about opportunities and roles on software development teams.
4. List classifications of computerized entertainment and give examples of each type.
5. Gather and share information on end user and creative perspective of software development.
6. Demonstrate problem-solving and analytical skills while using the design process and correcting programming mistakes.

Unpacked Learning Objectives

Students know:

- How to identify and explain the differences and similarities between different programming languages.
- How to build digital projects using a variety of object-based or language-based programming tools.
- How to research and obtain information about opportunities and roles on software development teams.
- How to identify classifications of computerized entertainment and give examples of each type.
- How to research and present information on the end user and creative perspective of software development.
- How to exhibit skills to show problem-solving while using the design process and correcting programming mistakes.

Students are able to:

- Identify and explain the differences and similarities between different programming languages.
- Build digital projects using a variety of object-based or language-based programming tools.
- Research and obtain information about opportunities and roles on software development teams.
- Identify classifications of computerized entertainment and give examples of each type.
- Research and present information on end user and creative perspective of software development.
- Exhibit skills to show problem-solving while using the design process and correcting programming mistakes.

Students understand that:

- There are differences and similarities between different programming languages.
- Being able to build digital projects using a variety of object-based or language-based programming tools is vital to the success of their selected career.

- Being able to research and obtain information about opportunities and roles on software development teams will help them in their selected career path.
- Being able to identify classifications of computerized entertainment and give examples of each type is a part of the career.
- Being able to research and present information on the end user and creative perspective of software development is vital to being successful as a programmer.
- Being able to exhibit problem-solving and analytical skills while using the design process and correcting programming mistakes is vital to the career.

Unit Driving/Essential Question	What are programming languages, how did they start and how do they benefit the world?
Exemplar High Quality Unit Task	Create an artifact demonstrating knowledge of different languages used around the world and some examples of what they are known for. Create an artifact depicting the programming life cycle and how it is used in the real world.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students identify and explain the differences and similarities between different programming languages.	Formative: Create programming artifact of history of programming	Present different programming languages that are being used in the professional world.		IDE of teacher choice, OnlineGDB.com, replit.com
Students build digital projects using a variety of object-based or language-based programming tools.	Formative: Create a working program that solves a problem. Formative: Using pair programming create a working program using the programming life cycle and document their project in a daily journal.	Brainstorm ideas with the students to create programs to solve real problems in their community.		minddomo.com mindmapping.com freemind.com
Students research and obtain information about opportunities and roles on software development teams.	Formative: Create a mind map of different roles in a software engineering team. Summative: Interview a programmer and present	Invite a speaker to come in and talk with students about working in a development team.		

	their story to the school community.			
Students identify classifications of computerized entertainment and give examples of each type.	Formative: Using technology build an artifact to exemplify the different genres of computerized entertainment	Present different types of software games or entertainment options and how they are classified in the professional world.		Google Presentation, Docs, web page, etc.
Students research and present information on end user and creative perspective of software development.	Summative: Build a new or redesign an old item with a team and present the new or updated version to the class	Create a presentation for the students on critiquing the end user experience and present them with several good and bad examples to critique		
Students exhibit skills to show problem-solving while using the design process and correcting programming mistakes.	Formative: Given a broken program the students will be able to debug the program and get it to function properly Summative: Students will create a new program and have to use debugging skills and teamwork skills to complete the project.	Create a program with errors in it, print this out and have the students pair up and give each individual student 1 minute to review the document for programming errors then switch. After they have looked independently, have them look together for 2 minutes, see if they can realize 2 people reviewing at once is better than doing it individually		

Key Vocabulary

programming languages, Java, C+, C++, Python, visual basics, digital projects, object based programming tools, language based programming, tools, software development teams, computerized entertainment, classifications of computerized entertainment, end user, creative perspective, software development, problem-solving skills, analytical skills, design process, programming mistakes

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

Creating a real world application to be used in community

CTSO Connection:

FBLA Mobile Application Development

Certification/Credential Connection:

N/A

Unit 3 Title: Web Design

Content Standards

7. Demonstrate how websites and web browsers interact with one another on the Internet.

8. Create a business web page.

Unpacked Learning Objectives

Students know:

- How to exhibit how websites and web browsers interact with one another on the Internet.
- How to create a user-friendly business web page.

Students are able to:

- Exhibit how websites and web browsers interact with one another on the Internet.
- Produce a user-friendly business web page.

Students understand that:

- Being able to exhibit how websites and web browsers interact with one another on the Internet is vital to the career.\
- Being able to produce a user-friendly business web page is vital to every business.

Unit Driving/Essential Question	How do websites contribute to the branding of a business? How can I build a website that is user friendly and can assist in building a business?
Exemplar High Quality Unit Task	Create a business website with a teammate that has interactive qualities to it.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students exhibit how websites and web browsers interact with one another on the Internet.	Summative: create a web page using hyperlinks into their own web page.	Using web pages can illustrate how they connect to each other, using hyperlinks.		http://www.wix.com
Students are able to create a business web page that is user- friendly.	Formative: Students can illustrate and describe what user-friendly interface is. Formative: Students can critique business websites for their usability. Summative: Create a webpage to illustrate how a local business site can be improved, or create a webpage for a brand new business.	Present good UX design principles to the students. Have them then go out and seek a bad UX designed web page and explain why they think it is a bad design, then seek out a good UX designed web page and explain why they think the design is good.		https://www.websitebuilderexpert.com/website-builders/free/

Key Vocabulary

websites, web browsers,websites and web browser interaction, web page, business web page

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

Interviewing community business people about their websites. Critiquing live business sites for usability.

CTSO Connection:

FBLA E-Business, UX Design, Website Design

Certification/Credential Connection:

Adobe Dreamweaver

Unit 4 Title: Customer Service and Leadership

Content Standards

9. Demonstrate different ways in which communication can be used within the workplace.
   9a. Describe the different types of skills employees should use with customers.

10. Describe important aspects of large-scale software design processes and implementation.

11. Describe processes involved in global economy and supply chain implementation of software.

12. Explain the importance of audience and equity when designing a program.

Unpacked Learning Objectives

Students know:

- How to select the best communication plan for different situations in the workplace.
- How to interact with customers in a professional business manner.
- How large-scale software design is used and implemented within the workplace.
- How the global economy process works with software.
- How the software supply chain works.
- Why it is important to know your audience when designing a program.
- Know why it is important to create a program that is equitable.

Students are able to:

- Communicate correctly in front of a small or large group in an effective manner.
- Give examples of what communication skills are needed in the workplace for different scenarios.
- Interpret the important aspects of large-scale software design processes and implementation.
- Diagram the process of software in the global economy.
- Organize the steps of the supply chain implementation of software.
- Create a program that is for a particular audience and that is equitable.

Students understand that:

- Communication within the workplace is different from communication in a casual atmosphere.
- Communication in the workplace is different from communication at home.
- Software design process and implementation is different on a large-scale.
- Software is critical in the global economy and supply chain.

- Technology must be created for equality.

Unit Driving/Essential Question	How does one deal with unhappy and happy customers and lead your team to become top performers in your environment?
Exemplar High Quality Unit Task	Create a script to act out between classmates, with a customer that is upset and how the customer relations student deals with the issue and one that the customer is happy and how the customer relations student deals with that.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students can model the correct communication for each situation in the workplace.	Formative: listen to how students ask and answer questions with their peers for professional interaction	Role play angry and happy customer feedback		https://www.psychologytoday.com/us/blog/living-the-questions/201503/20-expert-tactics-dealing-difficult-people
Students illustrate different types of skills employees should use with customers.	Formative: create an infographic or comic strip with examples of professional skills used with customers and	Discuss and critique case studies from customer feedback		https://www.skillsyouneed.com/ips/difficult-customers.html https://www.vendhq.com/blog/how-to-deal-with-difficult-customers/
Students will outline important aspects of large-scale software design processes and implementation.	Summative: Using technical tools create a project plan for a software program	Flip the classroom and have the students view the video on Large Scale design process, have a discussion in class about the process		https://youtu.be/CH05aRszfxI https://youtu.be/6pjGuuGsqxE
Students will chart the processes involved in the global economy and supply chain implementation of	Formative: Create a digital artifact depicting the availability of different software packages	Create a presentation about the different software used to manage supply chains.		https://supply-chain-management.logisticstechoutlook.com/vendors/top-

software.		Invite a community member in to discuss their supply chain solution.		supply-chain-solution-companies.html
Students debate the importance of audience and equity when designing a program.	Formative: Critique various websites for ADA compliance	Presentation of ADA Compliance for web pages.		

Key Vocabulary

customer service representative/customer service rep, over-the-phone customer service, face-to-face customer service,technical support/tech support, product sales support, outsourcing, call center, customer service training, customer base, customer loyalty, automated customer service

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

Critiquing of business webpages, go to community and evaluate local businesses

CTSO Connection:

FBLA E-Business, Web Page

Certification/Credential Connection:

N/A

Unit 5 Title: Career Opportunities

Content Standards

13. Gather information on career and entrepreneurial opportunities in the field of computer programming.

Unpacked Learning Objectives

Students know:

- How to find job opportunities in the field of computer programming.

Students are able to:

- Obtain information on career and entrepreneurial opportunities.

Students understand that:

- Job opportunities for computer programming are plentiful and are becoming more and more popular and in demand.

Unit Driving/Essential Question	What are the careers that can open up by having a programming background?
Exemplar High Quality Unit Task	Present a career research project to the school community.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students research information on career and entrepreneurial opportunities in the field of computer programming.	Formative: Create a mind map of different careers in the programming field. Summative: Present a research based project to school community	Have a speaker from the community come in to talk about their path to their career.		

Key Vocabulary

computer programming

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

Community members

CTSO Connection:

FBLA: Cyber Security, Network Design, Network Infrastructures, UX Design, Coding & Programming, Entrepreneurship, Electronic Career Portfolio, Job Interview DECA Entrepreneur of Tomorrow Challenge; Career Development Project

Certification/Credential Connection:

N/A

Unit 6 Title: Computational Thinking

Content Standards

14. Demonstrate comprehension of programming logic.

15. Create an algorithm with variables using pseudocode then translate to a programming language.

16. Design a function to simplify a task and explain how abstraction was used in the design process.

Unpacked Learning Objectives

Students know:

- How to create and use a flowchart to demonstrate their programming logic.
- How to create pseudocode and then express it into a programming language (code).
- How to design a function that makes code simple.
- That using abstraction makes code simple.

Students are able to:

- Use programming logic to diagram conditionals, sequencing, iterations, and simple loops.
- Construct an algorithm using pseudocode.
- Use their pseudocode to create a program in code.
- Generate a function to simplify a task.
- Debate how abstraction was used in the design process.

Students understand that:

- Flow charts are an essential part of programming.
- Algorithms and pseudocode are necessary steps in creating code that is correct.
- Functions and abstractions are used to simply code programs so they are easier to read and debug.

Unit Driving/Essential Question	How is an algorithm created and used in programming? How is an abstraction created to assist in programming? How will computation thinking change the way you interact with computers?
Exemplar High Quality Unit Task	Create an algorithm and document it with a flowchart or as pseudocode, which is then used to create a program.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students create a simulation of programming logic using a flow chart.	Summative: Create a flowchart for a game and trade with classmates to evaluate accuracy.	Create a flowchart to solve a problem, for example get to the cafeteria in your school.		https://www.lucidchart.com/pages/what-is-a-flowchart-tutorial
Students compose an algorithm with variables using pseudocode. Students use the pseudocode to create a program using code.	Formative: Convert flowchart to pseudocode that solves a problem. Summative: create pseudocode to then be used to build a functional program that solves a problem	Present to the class pseudocode and flowcharting		https://www.wikihow.com/Write-Pseudocode
Students construct a function that will make a task less complicated. Students will summarize how abstraction was used in the design process.	Formative: build a simple calculator program that calls the different math operations using a function to manage the complexity of their program.	Find a program that is already a calculator that can be displayed to the students and have them watch you up front then, ask them to recreate it.		

	Summative: document the function in their program and how it works and why it is necessary for the overall functionality of the program.			

Key Vocabulary

programming logic, conditionals, sequencing, iterations, simple loops, algorithm, pseudocode, programming language, flowchart, block coding, function, abstraction, design process

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

N/A

CTSO Connection:

FBLA: Cyber Security, Network Design, Network Infrastructures, UX Design, Coding & Programming

Certification/Credential Connection:

N/A

Unit 7 Title: Digital Culture

Content Standards

17. Identify methods that businesses and their employees can use to secure data online.

18. Evaluate the different modes of social engineering and determine how they affect society.

19. Promote positive, safe, legal, and ethical behavior online.

20. Describe the impact of data permanence on personal and professional digital identity.

21. Analyze current events, and compare and contrast the scope, emphases, and biases of information available from digital sources across the globe.

22. Examine the role of censorship and bias in society and global culture.

23. Explain the importance of using assistive technologies to produce a product.

24. Contrast the positive and negative impacts of artificial intelligence in industry.

Unpacked Learning Objectives

Students know:

- How to select the most reliable method of protecting a business' online data.
- The difference between phishing, hoaxes, spoofing and baiting.
- How these affect society in a negative way.
- The safety procedures to take while working online.
- That correct data is important for personal and professional identity.
- How to find and read current events from digital sources,
- How to compare and contrast the scope, emphases, and biases of digital information.
- How the role of censorship and bias in society affects our daily lives.
- The role of censorship and bias in our global culture.
- How assistive technology can help produce a product.
- How artificial intelligence impacts industry.

Students are able to:

- Select the proper methods businesses should select to protect their online data.

- Assess social engineering and debate how it affects society.
- Work online in a safe, ethical, and legal manner.
- Determine the impact of correct data on personal and professional identity.
- Find current events from across the globe.
- Compare and contrast, emphases, and biases of information from current events.
- Summarize the role of censorship and bias in society and global culture.
- Interpret how assistive technology can help produce a product.
- Compare and contrast the positive and negative impacts of artificial intelligence in industry.

Students understand that:

- There are different methods of securing online data and it is important to have it secure correctly.
- Social engineering is negatively affecting our society and how to navigate away from it.
- In order to be safe online, one must be positive, legal and ethical in all manners online.
- Incorrect data can be harmful to you personally and in the business realm.
- Digital information is always changing and evolving, so being able to find the information and understand it is a necessary skill in the digital world.
- Censorship and bias should not be part of society and global culture.
- Assistive technology is useful and important when producing products.
- Artificial intelligence can be positive or negative within industry.

Unit Driving/Essential Question	How can computer hackers provide a benefit to society? How can one secure their personal and business information? How will artificial intelligence affect our society?
Exemplar High Quality Unit Task	Create an artifact depicting how AI has and will affect society, culture or economy. Create an artifact to inform the community about security issues that affect them.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students select a method of security to protect data online.	Formative: Students can describe and determine if an online resource is using any sort of security	Demonstrate different methods of securing personal data and the difference between personal and private information.		http://www.cyber.org
Students will conclude what different modes of social engineering are and how they affect society.	Formative: Jigsaw the different case studies to discuss real world social engineering and how they have affected society. Formative: Discuss the ethics of social engineering.	Present case studies to the students to talk about social engineering. Jigsaw different pieces of case studies.		https://www.social-engineer.org/social-engineering/def-con-kids/
Students recommend and teach how to be safe, legal, and ethical while working online.	Summative: Create a digital artifact to publish to the school community or local community.			
Students explain why data permanence is important	Formative: Research how colleges and businesses			

when dealing with personal and professional digital identity.	use social media to affect acceptance into college or job acquisition.			
Students investigate current events from digital sources across the globe. Students investigate current events for information that is biased. Students compare and contrast the scope and emphases of information available from digital sources across the globe,	Formative: Using Technology in the News - present to the class their own topic and how it is affecting society, culture or economy.			Technology in the news across the Internet: https://www.bbc.com/news/technology https://www.cnbc.com/technology/ https://www.cnn.com/business/tech https://scitechdaily.com/news/technology/ https://www.usnews.com/topics/subjects/technology https://www.pcmag.com/news
Students look at the role of censorship and bias in society and global culture.	:	Debate censorship in the world		
Students give examples of how assistive technology is important in producing a product.	Formative: Investigate and create a digital artifact to inform school or local community about assistive technologies.	Have a community member come in and discuss how their assistive technologies are being used in the professional world		
Students debate the positive and negative impacts of artificial intelligence in industry.		Discussion and taking a stand on ethical issues in a classroom discussion		https://www.aiethicist.org/ethics-cases

Key Vocabulary

online data security, phishing, hoaxes, spoofing, baiting, online safety, ethical, brochure, digital citizenship, data permanence, digital identity, biases, digital sources, censorship, bias, global culture, assistive technology, artificial intelligence

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

N/A

CTSO Connection:

FBLA: Cyber Security, Network Design, Network Infrastructures, UX Design, Coding & Programming

Certification/Credential Connection:

N/A

Unit 8 Title: Systems and Modeling

Content Standards

25. Explain networks and specific set-ups needed for a business environment.

26. Determine effective cyber security methods for protecting a company.

27. Diagram a model that represents a system inside a company.

28. Create a simulation to test a model.

Unpacked Learning Objectives

Students know:

- That a business needs certain networks and specific set-ups.
- Different effective methods of cyber security are needed for protecting a company.
- That there are systems in place inside companies.
- How to create a program simulation.

Students are able to:

- Summarize how networks and specific set-ups are needed for a business environment.
- Assess cyber security methods that will be effective for certain companies.
- Organize a model that represents a system inside a company.
- Create a simulation to test a computer model.

Students understand that:

- Businesses require certain networks and set-ups.
- Cyber security for any company is crucial to protecting data.
- Models of systems within a company are universal.
- Using simulations to test models is an effective way to debug any flaws.

Unit Driving/Essential Question	How can we use systems processing for engineering software and being aware of security issues?

Exemplar High Quality Unit Task	Research a real world problem and build a simulation to explore how it is affecting society, culture or economy.

Map of Student Learning by Learning Objective

Unpacked Learning Objective SWBAT	Potential Subtasks for Assessments Formative/Summative	Potential Learning Activities Learning Activity Checklist Link to Differentiation Examples	Integrated and Related Academic Content: ELA, Math, Science, and/or Social Studies Concepts & Activities	Equipment, Technology & Materials Equipment List by CTE Cluster Link to Helpful Tech Tools
Students diagram networks and specific setups needed for a business environment.	Formative: Create a network diagram of their personal network at home Summative: Create a network diagram of a local community environment, for example a local library, local grocery store or the school.	Present different types of networks for personal and business use, including WAN, MAN, Mesh Network, WIF, etc.		Networking cables, computers, fiber cable, router, switch, internet, etc
Students plan an effective cyber security method for protecting a company.	Formative: Collaboratively create a policy document for a real world company to implement security to the environment.	Present ways to secure networks for personal and business environments		http://www.cyber.org
Students create an illustration that represents a system inside a company (i.e. supply and demand, new business model).				
Students invent a simulation to test a model.	Summative: Research a real world problem that can	Build a simulation program with the students to show		

	then have a simulation built and tested.	how they can use software to simulate real world scenarios.		

Key Vocabulary

network, encryption, cyber security, supply, demand, simulation

Work-Based Learning, Simulated Work Experiences, and Experiential Learning:

Investigate local businesses, interview local community business owners, evaluate real businesses

CTSO Connection:

FBLA: Cyber Security, Network Design, Network Infrastructures, UX Design, Coding & Programming

Certification/Credential Connection:

N/A