COURSE DESCRIPTION

Course Title: Middle School Coding I - Introduction
Course Number: 10738
Course Prerequisites: none

Course Description: Learn all about the technology you use in your day-to-day life and explore how the internet functions through this introduction to coding. Build your knowledge of algorithms, programming constructs, and program design to create your own code. Discover how to solve problems with code while dabbling with Tynker and Python to begin your journey into this exciting field!

Suggested Grade Level: Grades 6-8
Length of Course: One Semester
Units of Credit: None
PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:
CSPG 65
To find the CSPG information, go to https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx
Certification verified by the WCSD Human Resources Department: ☒Yes   ☐No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Academic
Mark Types: Check all that apply.

☒F – Final Average   ☒MP – Marking Period   ☐EXM – Final Exam

GPA Type: ☐ GPAEL-GPA Elementary   ☒ GPAML-GPA for Middle Level   ☐ NHS-National Honor Society
☐ UGPA-Non-Weighted Grade Point Average   ☐ GPA-Weighted Grade Point Average

State Course Code: 10152
To find the State Course Code, go to https://nces.ed.gov/forum/sced.asp, download the Excel file for *SCED*, click on SCED 6.0 tab, and chose the correct code that corresponds with the course.

TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:
  Title:
  Publisher: Edynamic Education
  ISBN #:   Virtual Coursework
  Copyright Date:
  WCSD Board Approval Date: 9/14/2020

Supplemental Materials:

Curriculum Document

WCSD Board Approval:
  Date Finalized: 8/12/2020
  Date Approved: 9/14/2020
  Implementation Year: 2020-2021

SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

ASSESSMENTS

PSSA Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

Formative Assessments: The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

  Effective formative assessments for this course include: Quizzes, homework, discussions

Summative Assessments: The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

  Effective summative assessments for this course include: unit assessments and semester exams

Course Syllabus

Middle School Coding 1a: Introduction

Learn all about the technology you use in your day-to-day life and explore how the internet functions through this introduction to coding. Build your knowledge of algorithms, programming constructs, and program design to create your own code. Discover how to solve problems with code while dabbling with Tynker and Python to begin your journey into this exciting field!

Unit 1: Crack the Code!

Got problems? No problem! Computers can be used in many ways to help us solve them, but they're not the answer to everything. Sometimes good old human ingenuity is the key. We'll begin by solving some puzzles and exploring a secret computer that might be hiding in your home! Then, we'll start cracking some code with the help of a little green friend. When we harness the power of algorithms, code, and turtles—yes, turtles! —we can accomplish some really incredible things. Let's go code!

What will you learn in this unit?

- Create algorithms to solve word games and puzzles
- Identify the components of a computer system
- Define the term algorithm and explain how it applies to computers
- Distinguish between problems that are better suited for humans to solve than computers and vice versa

Unit 1 Assignments

Assignment	Type
Unit 1 Text Questions	Homework
Unit 1 Lab	Homework
Unit 1 Activity 1	Homework
Unit 1 Activity 2	Homework
Unit 1 Discussion Assignment 1	Discussion
Unit 1 Discussion Assignment 2	Discussion
Unit 1 Quiz	Quiz

Unit 2: There's Nothing "Soft" about Software!

Video Are you ready for some more coding fun? Well, get your fingers warmed up because we are going to be practicing our typing skills! Programmers like you need to use keys on the keyboard that some people will never use. We don't want to go on a scavenger hunt every time we need to type a curly bracket or backslash, so let's learn them now! But typing is not the only thing you'll need to be a successful computer scientist. We're going to see how software can improve your life and the lives of others. You'll also get some hands-on experience with creating a database for a local deli. Sandwich, anyone?

What will you learn in this unit?

- Define the term "software" and explain how software helps businesses perform tasks
- Understand why file types are necessary and describe the content contained in different file types
- Compare and contrast types of software and recommend the software that's best suited for a task
- Improve keyboarding skills by typing frequently using symbols in code
- Explain the purpose of a database and perform common database operations

Unit 2 Assignments

Assignment	Type
Unit 2 Text Questions	Homework
Unit 2 Lab	Homework
Unit 2 Activity	Homework
Unit 2 Discussion Assignment 1	Discussion
Unit 2 Discussion Assignment 2	Discussion
Unit 2 Quiz	Quiz

Unit 3: Let's Play!

From turtles to software to databases to typing, we've covered a lot of ground so far. You've prepared well, and now you're ready to start learning how to code. But it won't feel like work—the opposite, in fact! You'll be having so much fun creating characters and stories that you might wonder whether you're just playing around. You will use a block-based programming website to help you control a program and learn some of the foundations of coding. You'll also find and fix problems in a program. And, who knows? There might just be a flying dragon (yes, another reptile!) or a speeding car in your future. Let's get ready to play!

What will you learn in this unit?

- Understand how block-based programming can be used to code
- Create simple programs in Tynker
- Define and apply the three main programming constructs—sequence, selection, and iteration
- Learn how to debug a program.

Unit 3 Assignments

Assignment	Type
Unit 3 Text Questions	Homework
Unit 3 Lab 1	Homework
Unit 3 Lab 2	Homework
Unit 3 Activity 1	Homework
Unit 3 Activity 2	Homework
Unit 3 Discussion Assignment 1	Discussion

Unit 3 Discussion Assignment 2	Discussion
Unit 3 Quiz	Quiz

MS Coding 1a Midterm Exam

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first three units in this course. (Note: You will be able to open this exam only one time.)

Midterm Assignments

Assignment	Type
Midterm Exam	Exam
Midterm Discussion Assignment	Discussion

Unit 4: It's All Greek to Me!

Did you know that there are other ways of counting numbers besides the way we normally count? Did you also know that a computer is only able to understand two numbers—0 and 1? Get ready to think like a computer and dive into the details of how words, pictures, and music are actually stored as numbers. We'll then explore how programming languages can interact with a computer and what each language has in common. Finally? A lesson on how to clean your house. Now grab your broom, and let's get swept away with coding languages!

What will you learn in this unit?

- Describe how and why computers use binary
- Convert between binary and decimal number systems
- List and discuss the four components of programming languages
- Identify and use two common approaches for program design

Unit 4 Assignments

Assignment	Type
Unit 4 Text Questions	Homework
Unit 4 Lab	Homework
Unit 4 Activity	Homework
Unit 4 Discussion Assignment 1	Discussion
Unit 4 Discussion Assignment 2	Discussion
Unit 4 Quiz	Quiz

Unit 5: Snake Charmer

It's finally the moment we've all been waiting for! We have laid a solid foundation and are now ready to embark on our first adventure of writing code. We are going to face the snake and begin learning the ins and outs of the Python programming language. We'll combine some of the components of programming

languages with our lightning-fast code-typing skills. We will also write some basic (but fun!) text games. Be prepared to face the snake!

What will you learn in this unit?

- Comfortably use an online IDE to write code
- Understand the difference between the Editor and the Interpreter screens
- Use variables containing different data types and correctly type cast
- Receive and process user input
- Write a program that takes user input and applies a mathematical formula to it

Unit 5 Assignments

Assignment	Type
Unit 5 Text Questions	Homework
Unit 5 Lab	Homework
Unit 5 Activity	Homework
Unit 5 Discussion Assignment 1	Discussion
Unit 5 Discussion Assignment 2	Discussion
Unit 5 Quiz	Quiz

Unit 6: Flexing Our Python Muscles!

Now that you've whet your appetite for more coding challenges, get ready to take your Python skills to the next level! We are going to learn how to control our code by using if statements. We'll get a bit dizzy with loops, using them to make a game and a program to generate secure passwords. You will surely be inspired to go even further with your Python coding skills, creating new and exciting programs to share with family and friends!

What will you learn in this unit?

- Regulate the flow of a program by using *if* statements
- Understand and use *for* loops to repeat a block of code a specific number of times
- Understand and use *while* loops to repeat a block of code until a condition is satisfied
- Increment a variable to keep count

Unit 6 Assignments

Assignment	Type
Unit 6 Text Questions	Homework
Unit 6 Lab	Homework
Unit 6 Activity	Homework
Unit 6 Discussion Assignment 1	Discussion
Unit 6 Discussion Assignment 2	Discussion
Unit 6 Quiz	Quiz

MS Coding 1a Final Exam

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from all units in this course. (Note: You will be able to open this exam only one time.)

Final Assignments

Assignment	Type
Final Exam	Exam
Class Reflection Discussion Assignment	Discussion