TCH036: Computer Science I (Elective)

Course Overview

This course introduces students to computer science concepts such as computer architecture, networks, and the Internet. Students use object-oriented programming, event-driven processes, modular computer programming, and data manipulation algorithms to produce finished software programs. They use the design process to create many programs by determining specifications, designing the software, and testing and improving the product until it meets the specifications. By the end of this course, students will have a solid foundation for further study in this subject.

COURSE LENGTH: One semester

SOFTWARE: Free download provided in course

SYSTEM REQUIREMENTS: Microsoft Windows or Mac OS X operating systems—Windows XP, Windows Vista, or Windows 7 recommended; at least 100 MB of available hard drive space

PREREQUISITES: None

Course Outline

Students learn the computer requirements and other basic information for the course. They set up files and folders, install the course software, and learn to use zip utilities. They also learn to identify sources of trustworthy information, the definition of plagiarism, and how to properly cite information.

- Start the Course
- Set Up Your Computer
- Set Up a Browser and Install 7-Zip
- Find and Complete Coursework

Section 1: Intro to Python

Students learn some of the basics of Python and practice drawing lines and shapes.

- Draw a Line
- Draw Shapes
- Write a Program

Section 2: Graphical Hello World

Students work with coordinates, comments, spaces, and functions.

- Draw an H
- Comments and Spaces
- Define a Function
- Define the Letter Functions

Section 3: Variables

Students work with values, operators, variables, and strings.

- Values and Variables
- Functions and Variables

Section 4: Loops

Students practice using loops, range, speed, and debugging techniques.

- For Loops
- Loops and Bugs

Subject to change:

Section 5: Interactive Turtles

Students learn about file manager programs, file paths, the onclick() function, buttons, and docstrings.

Section 6: The Design Process

Students learn how to define client and project requirements, input/output requirements, system processing and software specifications, and scope of work.

Section 7: Design a Software App Plan

Students learn about software application plans, principles of system design, algorithmic and data structures, constraints, and modular and logical design.

Section 8: Python Code Style

Students take a more in-depth look at recommended Python coding style and practice indentations, code blocks, and code comments.

Section 9: More Loops and String Manipulation

Students learn about operators, if/else and while loops, strings and string manipulation, lists, and boolean expressions.