**TOMPKINS CORTLAND COMMUNITY COLLEGE**

CSCI 160 - Computer Science I

**Course Outline**

**INSTRUCTOR:** William LaMorie

**OFFICE:** Room 304 Groton High School

**PHONE:** 607-898-5802 x 304

**OFFICE HRS:** 2:45-3:15 pm M-Th

**SEMESTER:** Fall 2018

**CREDITS:**  3

**COURSE DESCRIPTION:**

This course introduces students to computer science via programing with a common language, in order to solve problems and process information. Topics include programing concepts and abstractions such as variables, types, looping and iteration, and higher order structures such as functions, files, and objects. Students will also explore cyber physical systems using IFTTT and purposed designed devices, and examine the basics of GUI design with mindfulness of UD and UX principles, and develop algorithmic thinking methodologies.

**PREREQUISITES:**

Three years of high school math including trigonometry, or permission of student services and the course instructor; grade level appropriate completion of English language education.

**GENERAL COURSE OBJECTIVES:**

* Become proficient, at an appropriate skill level, in designing, coding, testing, and debugging computer programs.
* Begin to develop skills in challenge reduction and granularization to support problem solving using algorithmic thinking.
* Learn basic concepts and principles of the discipline of computer science to build a foundation for further study.
* Develop good programming habits, commenting, documenting, and style.
* Understand the basic control structures used in programming, and master their use in procedural programming.
* Understand ways to use input from multiple sources and create output to many device types.
* Become aware of the history of computer science, and ethical issues within the field, and in product development.
* Develope computer lab skills.

**TEXT:**

*JavaScript: A Beginner's Guide, Fourth Edition* 4th Edition by John Pollok, McGraw-Hill Education, 2013, ISBN 978-0071809375

*JavaScript Robotics: Building NodeBots with Johnny-Five, Raspberry Pi, Arduino, and BeagleBone (Make)* 1st Edition by Rick Waldron and Backstop Media, Maker Media, Inc, 2015, ISBN 978-1457186950

**MATERIALS:**

Access to Google Drive, computer, flash drive, and a smart device. Arduino and IFTTT devices will be provided as needed.

**COURSE CONTENT:**

Unit 1: Problem Solving & Computer Science

The History of Computer Science Computer Science Terminology

Introduction to Algorithms Computer Basics

Data Types Problem Abstraction

Unit 2: Web Development

The Modern Web & its uses Introduction to Web Technology Sacks & Terms

Web Ethics, UX, & UD HTML & CSS

Responsive Design Debugging for the Web

Commenting & Structure Conventions Aesthetics & Design

Unit 3: Basic Application Development

Basic Control Structures The Program Loop & Nesting

Variables Sprites

Animations Using Input - Boolean Operations & indexing

JavaScript Objects

Function s Namespaces

Unit 4: The Engineering Design Process

Iterative Development Processes Design Considerations

User Feedback & UX Testing

Commenting and Group Projects Prototyping

Ethics in Programming Versioning and Repos

Unit 5: Using & Storing Data

Sources of Data Ethics of Data Collection

Ethics of Data use & Representation Types of Data

Data Storage Systems Big Data & Making Decisions with Data

ASCII, Binary, Hex Data & Security

Unit 6: Cyber-Physical Programing

Using Input from Devices Sending Output to Novel Systems

Objects as Data Advanced Variable Types

Inheritance Physical Prototypes

**REQUIREMENTS FOR SATISFACTORY COMPLETION OF COURSE:**

Course requirements to be fulfilled for a grade are:

* All programing exercises must be satisfactorily completed and turned in for grading in order to be considered for completion of the course.
* Students must meet DEADLINES for assignments (or receive reduced credit).
* Homework/quizzes/tests must be passed.

**METHODS FOR EVALUATING STUDENT PERFORMANCE:**

Grading Policy:

## Testing: 40%

**Programing projects/labs: 40%**

**Homework & other: 20%**

Grading Scale:

A 94-100 B- 80-82 D+ 67-69

A- 90-93 C+ 77-79 D 63-66

B+ 87-89 C 73-76 D- 60-62

B 83-86 C- 70-72 F Below 60

Attendance will be taken in accordance with College policy. It is the student’s responsibility to attend class. If a student misses a class for any reason, the student is responsible for any material covered, announcements, and assignments.

Each student should be familiar with the *Student Code of Conduct* in the TCCC Student Handbook, be considerate of others, be professional and be able to act as an adult attending a college level class.