

**Concurrent Enrollment Course Outline**

**High School**: Groton Central School

**Instructor**: William LaMorie

**Instructor e-mail and/or phone #**: 607-898-5802 x 304

**Tompkins Cortland Course # (Credit Hours)**: CSCI 160 (3 Credits)

**Tompkins Cortland Course Title**: Computer Science I

**Semester & Hours**: Fall 9:00 AM - 11:00 AM Monday - Thursday, 9:00 AM - 10:00 AM Friday

**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.

**Course Prerequisites**:

Three years of high school math including trigonometry; grade level appropriate completion of English language education. Student enrollment limited to grades 10 - 12.

**Minimal Basic Skills Needed to Complete Course Successfully**:

Writing: Student should have competent writing skills. The course requires short written short papers and reflections, as well as text that is presumed to be front facing to a consumer.

Math: This course requires fulfillment of or concurrent enrollment all math courses needed to fulfill the requirements of a regents diploma

Reading: Students should read at high-school level.

**Course Goals**:

* 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.
* Develop computer lab skills

**Texts and Materials**:

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

Additional Materials:

AdaFruit Arduino Playground

Code.org Game Lab

Internet Browser or IDE

LittleBits Kit

Smart Phone &/or tablet

**Class Modalities/Alternative Learning Strategies**:

Class content will contain a variety of presentation methods including:

* Major topics will be introduced by activities supported with mini-lectures, discussions, demonstrations, and Internet resources
* Class will be strongly project based
* Guest speakers and presenters will supplement learning
* Student collaboration will provide information sharing
* Shown work portfolios will be a major component of student learning
* Rubrics will delineate course expectations

**Required Readings, Presentations, Written Assignments, etc.**:

* In addition to being focused and participatory in class, students are to budget time outside of class for reading and completing assignments.
* To be acceptable, assignments, activities, and projects must achieve rubric expectations
* All assigned class work and homework should be completed by the due dates students will be penalized if they fail to turn in assignments on time.
* Any Written assignments must be turned in electronically, and checked for spelling and grammar errors.
* Student groups will produce a non-trivial artifact for this course. They will be responsible for identifying target audiences, and interacting with them to design and test the artifact.
* Students must demonstrate respect, interest, professionalism and interact positively with business people, teacher, and peers.

**Course Content Presented in Units or Segments**:

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

Indexing Strings, simple arrays

Boolean Operations & Boolean Algebra

JavaScript

Objects

Functions & their parts

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 & 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 & higher order arrays/maxtries

Inheritance

Physical Prototypes

**Evaluation/Grading System**:

**Assignments/Projects:**

Each graded activity will contain a rubric that identifies student expectations

**Examination Policy:**

Tests (exams) must be taken at scheduled time.

**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

Anyone caught cheating on any assignment, activity, or project will receive a grade of zero for that item.

**Statement of Academic Integrity**: Identify your school’s policies and procedures and clearly delineate how you address first time and subsequent academic infractions within your course (including, but not limited to, reduction in grade, elimination of grade, failure for the course). Instructors may decide on varying consequences depending on whether the infraction was intentional or not. Please refer to the College’s statement of academic integrity (below) and the policy for violations: <http://www.tompkinscortland.edu/catalog/pp_ac_violation.asp>

**Tompkins Cortland Community College’s Statement of Academic Integrity**

Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

**Make-Up Policy/Late Work**:

Late work will earn a late grade. Students absent with a medical or other valid excuse may meet with the teacher during office hours to arrange for late work submissions, influence on grade, etc.

**Attendance Policy**:

Attend every class to maximize learning and participation points. Attendance will be taken in accordance with high school/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. Students will not be penalized for classes missed for medical, religious, or family emergency reasons, but it is expected that they make up work in a timely manner.

**Student Responsibilities**:

* Attend every class to maximize your learning and participation points.
* Pay attention in class and arrive on time to maximize your participation points
* Refrain from miscellaneous (non-class related) talking and/or disruptions that will result in loss of participation points at instructor’s discretion
* Do homework prior to coming to class.
* Finish class assignments before the next class.
* Stay focused in class (do not surf the web or do work from another class)
* Contact the teacher immediately when you have questions or concerns. Do not wait until the end of the marking period or semester.

**Appropriate Academic Adjustments:** Use and adapt the following language for your outline:

Appropriate academic adjustments must be provided to students with disabilities that may affect their ability to fully participate in course activities or to meet course requirements. Such accommodations provide equal access, but may not lower academic standards for the course nor substantially alter the course’s essential requirements.

Indicate the process students must follow in your district to develop an access plan for the college course (IE, who to contact to develop a 504 plan). Refer to the policy regarding academic adjustments for students with disabilities on the CollegeNow [website](http://www.tompkinscortland.edu/CollegeNow/concurrent/is_enrollment_guidelines.asp), which includes College contact information if questions arise regarding accommodations.

*Please include the following statement in your outline and direct students to our website for guidance on College policies, resources, and their rights and responsibilities:*

**Tompkins Cortland Community College Expectations and Resources**

Students and families should review the guidelines provided on CollegeNow’s website for information on College expectations and policies, implications for academic standing and financial aid, accessing learning resources and services, and transferring college credits. Student Resource links appear on the right side of the CollegeNow homepage at [www.tompkinscortland.edu/collegenow](http://www.tompkinscortland.edu/collegenow)