Chelsea Tutorials
2021 - 2022

Programming: Physical Computing with Arduino (9th through 12th grade)

Course Description:

By the end of this course, the students should be able to

1. Setup and utilize a development system for simple Arduino microcontrollers
2. Write simple block oriented programs
3. Learn the basic syntax of Ch, a C-like programming language
4. Understand basic electrical circuits and how to wire up sensor circuits to use with an Arduino microcontroller
5. Learn how to pursue different applications utilizing the Arduino platform and other platforms.

Prerequisite: Exposure to algebraic concepts.

Instructor: Chuck Summers graduated from Georgia Institute of Technology with a bachelor's in Electrical Engineering in 1975 and earned a master's in Electrical Engineering in 1981. In addition to his engineering career, he has taught in several Christian Schools and with home school cooperative programs (algebra 1, algebra 2, geometry, physical science, and Latin). While living in Woodstock, Georgia, he worked at a tutoring facility with precalculus, calculus I and II, and physics students. Mr. Summers also tutors privately algebra, geometry, precalculus, calculus, and physics.

Mr. Summers not only enjoys interacting with students in math and science, he is actively learning new math and hobbies including radio, astronomy, rocks and minerals, electronics and ham radio. He believes that only on the basis of an understanding of the God of the Bible that any knowledge is possible. He enjoys learning about how God's technology: how He has made things function.

Chuck and Becky (a wonderful, understanding woman) have been married 48 years. Together they raised 7 children, have seven grandchildren and one great-granddaughter. They reside in Harpersville.

Contact info: phone: 770-309-1984
email: summers.chuck@gmail.com

Text: LearnArduino.pdf
This is a downloadable book available at https://c-stem.ucdavis.edu/boards.

Other Requirements:
A laptop which can be connected to the internet and satisfy the minimum requirements at
www.aleks.com/support/system_requirements.
A laptop with a USB port and an Arduino UNO board.
You should purchase the Arduino Compatible Uno Starter Kit available at
https://www.barobo.com/product-page/arduino-uno-starter-kit

Location: TBD… somewhere in Chelsea ☺

Day: Tuesday

Time: 2:00 – 3:30

Grade Level: 9th - 12th grade

Tuition and Fees:

Registration Fee: $25 nonrefundable payable to Chuck Summers

Tuition: $185 per semester payable to Chuck Summers

Facility Fee: The annual facility fee for this class is $30 per student, not to exceed $180 per family. This fee is payable to Grace Presbyterian Church, PCA, on the first day of class.

Class Minimum: The class will have a minimum of 4 students and a maximum of 8 students. If the minimum number of students is not reached, class may be canceled.

Additional Class Information

Learning Outcomes:

By the end of this course, you should be able to:

(1) Understand and use exponential and logarithmic functions.

(2) Understand and apply the unit circle with trigonometric functions and their identities to solve real-life problems.

(3) Apply vector concepts and operations on vectors with applications in physics.

(4) Be able to solve systems of equations with two and three variables using various techniques including matrix operations.

(5) Analyze and recognize conic sections and their mathematical representations.

(6) Understand and apply arithmetic and geometric series and sequences and be able to prove infinite sequences.

(7) Apply and understand combinatorics, combinations and permutations, as well as the binomial theorem.

(8) Recognize and use various applications of Pascal's Triangle

How to be successful in this course:

Whether or not you succeed in this course depends primarily on your choices. If you do a few things consistently, namely:

○ attend class and actively participate in class activities,

○ complete assignments on time, study for exams, and

○ seek help when you need it, both from your instructor, the internet, and fellow students, then you will give yourself every chance to be successful.

Class Policies

E-mail Policy: All e-mails sent regarding this class should be sent to my gmail account listed; All e-mail correspondence should be professional in tone and style. During a typical weekday I will reply to emails within 24 hours of receiving them. I typically check my e-mail frequently over the weekend as well, but it may occasionally take me longer than 24 hours to respond on weekends. Please be patient. I would not e-mail you a homework assignment and expect it to be completed in less than 24 hours.

Attendance: Attendance is essential to success in this course. Please be on time and stay for the entire class. Absences can be excused if we work out the appropriate work to keep up. I will work with you to make sure you have success in this class.

Tests Dates: TBD

Tests: There will be make-up tests if you need to learn the material. Your final exam score can replace the lowest score on a test.

Grading Policy: Course grade will be determined by your performance on tests, homework, and a final exam.

HW (in class mostly)	25%
Tests	50%
Final Exam	25%

Course grades will be assigned as follows:

At least 90	A
80-89	B
70-79	C
60-69	D
<60	F

Cell Phones/Electronics: Please keep these put away and silenced during class and test.

Academic Accommodations Policy: Any student with a documented disability or medical condition needing academic accommodations of class-related activities or schedule must contact the instructor immediately.