

**Basic Electronics  
CS315**

**Section 1: 1 – 3pm Mondays  
Section 2: TBA Mondays**

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**Course Overview:** Basic Electronics is focused on developing a practical, hands on understanding of electricity and circuit design.

This class meets once a week. Class time is divided into technical lectures and demonstration by your instructor, hands-on labs and in class work on projects. Expect to spend at least 3-6 hours out of class time weekly

**Course Objectives:**

Gain a practical understanding of analog and digital electronics.  
Learn the tools and techniques of practical electronics and circuit design.  
Develop an aesthetic, critical, and cultural framework for assessing electronic art practices.

**Optional Textbooks:**

Physical Computing, by Dan O' Sullivan and Tom Igoe. I highly recommend this book. I can be ordered online through the usual channels.

Online documentation for the basic stamp is available at [parallaxinc.com](http://parallaxinc.com)

I also recommend The Microcontroller Application Cookbook, by Matt Gilliland. This book can be also be ordered online.

**Materials:**

There is a \$25 materials cost for this class

**Website:**

[markallen.com/teaching/calarts/electronics](http://markallen.com/teaching/calarts/electronics)

## **Course Requirements:**

Completion of all assignments on time.

Demonstrated understanding of course materials through tests and homework

## **Grading:**

100 points total

## **Quiz**

2 quizzes 5 points each 10 points total

## **Presentation**

1 oral presentation 10 points

## **Projects**

gratuitous LED overuse 10 points

555 freestyle 20 points

trap 20 points

serial data secret decoder 10 points + 2 bonus points for winning team

talent show 20 points + 5 bonus points for winning team

## **Projects are graded on the following criteria:**

Is it working? (technical)

Is it awesome? (ambition and aesthetics)

Is it documented?

## **Grading:**

90-100 A

80-90 B

70-80 C

60-70 D

0-60 F

## **Miscellaneous details:**

Attendance: I will track attendance. You may miss 2 classes with impunity. Each

following absence will subtract two points from your final total of 100 points

Incompletes. No incompletes without confirmed extraordinary circumstances. Please consult the registrar for the definition of extraordinary circumstances.

**Back up your data!** Hard drive crashes, data loss and stuff blowing up are all well known phenomenon. No hardware disasters will be accepted for failing to submit work on time. Buy two of everything if you afford it. Avoid working on mission critical components the night before.

No swimming until three hours after eating.

**Weekly outline** (details are sure to shift, please consult website and instructor for weekly updates)

### **January 30th - DC Basics**

Introducing.  
Lab overview.  
Splitting into sections.  
DC Basics Lecture

### **Feb 6th - DC Basics 2**

Lecture: DC Basics part two  
Lecture: Prototyping + shopping  
Review material for Quiz # 1  
Assignment: Gratuitous LED project

### **Feb 13th AC, Electromagnetism, Capacitance and Induction**

Quiz #1  
Lecture: AC, Electromagnetism, Capacitance and Induction  
Work on LED project

### **Feb 20th Presidents day**

### **Feb 27th Semiconductors + integrated circuits**

Lecture: Transistors and other semiconductors  
555 demo  
Review for quiz #2  
LED project due  
555 freestyle assigned

### **March 6th - work on 555 freestyle**

Quiz #2

555 freestyle assigned

### **March 13th basic stamp introduction**

Lecture: Basic Stamp intro

Demo: Digital Input and Digital Output

555 freestyle due

### **March 20<sup>th</sup> Sensor Intro**

Lecture: Sensor overview

Demo: Sensor overview

Trap assigned

### **March 27<sup>th</sup> Spring Break**

### **April 3rd Making movement**

Lecture: Motors, Levers, Cams, gears

Demo: Servo and Stepper motor

Trap plan due

### **April 10th Work day**

Work on traps

### **April 17th Serial and Midi**

Lecture: Communication techniques

Demo: Serial and Midi

Traps due

serial data secret decoder assigned

### **April 24th Analog to Digital**

Lecture: Analog to Digital Conversion

Lecture: Opamps

Serial data secret decoder due

Talent show assigned

### **May 1st Work day**

Prepare for talent show

**May 8<sup>th</sup> Work day**

Prepare for talent show

**May 15<sup>th</sup>**

Compete in talent show with both sections