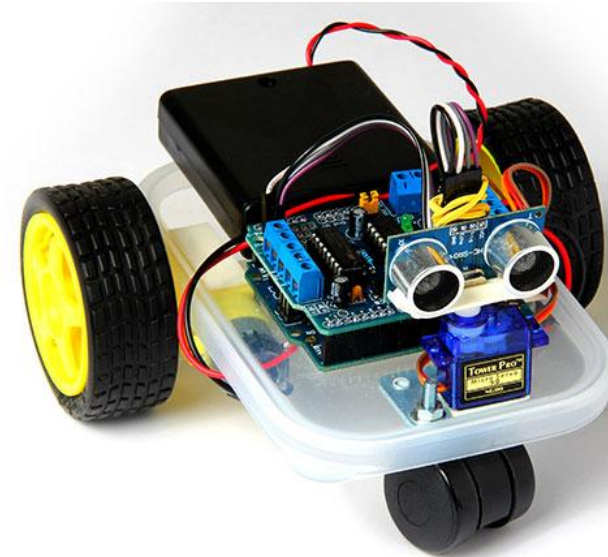




# EP486 Microcontroller Applications

## Topic 0

## THE COURSE



Department of  
Engineering Physics  
University of Gaziantep

Sep 2013

# Introduction

- Microcontroller is a small computer on a single integrated circuit containing
  - processor core,
  - memory
  - programmable input/output peripherals.



2 ATmegaxx micro controllers

# Introduction

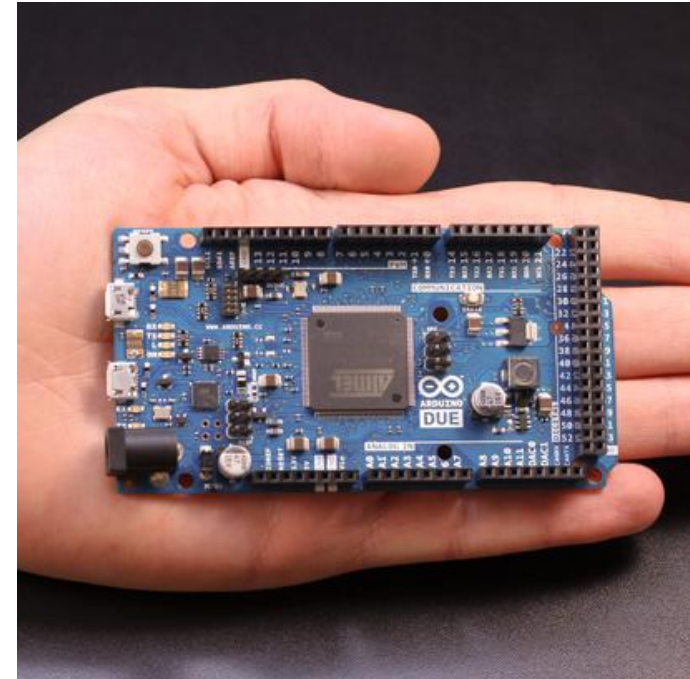


- The purpose of this course is *to review of electronics and C programming quickly and to give you an introduction to the Arduino.*
- Wikipedia says:  
*Arduino is a single-board microcontroller to make using electronics in multidisciplinary projects more accessible.*
- Arduino Says:  
*Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists and anyone interested in creating interactive objects or environments.*

# The Course



- **Course web page**  
<http://www1.gantep.edu.tr/~bingul/ep486>
- **Arduino Home Page**  
<http://arduino.cc>
- **Arduino Türkiye**  
<http://arduinoturkiye.com>



# Course Content



## \_ PART I (Electronics & Programming)

- Review of C Programming Language
- Introduction to Processing
- GUI Programming
- Basics of Analog Electronics (*resistors, diodes, transistors, ...*)
- Basics of Digital Electronics (*binary logic, gates, ADC, ...*)

## \_ PART II (Arduino Projects)

- LED, 7 Segment, LCD projects
- Sensor Projects  
(*temperature, humidity, pressure, light, sound, piezo, peltier, magnetic...*)
- Driving DC, Stepper, Servo motor projects
- RF and BlueTooth projects
- High-Power Control
- Data analysis and monitoring

# Lectures, Labs, Exams



## ■ Mondays

*3-3 hour lecture lecture*

**13:30-16:30 Engineering of Physics Seminar Room**

**16:30-18:50 Engineering of Physics Seminar Room**

## ■ Exams

➤ 1st midterm	30%	Oct 2013	(written)
➤ 2nd midterm	30%	Nov 2013	(project)
➤ Final	40%	Jan 2013	(project)

# Grading

Independent from the arithmetic mean of the class, the following rules will be applied:

- 00 – 19 >> **FF**
- 20 – 29 >> **FD**
- 30 – 39 >> **DD**
- 40 – 49 >> **DC**
- 50 – 59 >> **CC**
- 60 – 66 >> **CB**
- 67 – 74 >> **BB**
- 75 – 84 >> **BA**
- 85 – 99 >> **AA**

# Arduino Products



<http://arduino.cc/en/Main/Products>

## Arduino Uno



## Arduino Mega



## Arduino Micro



## Arduino Nano





# Arduino Kit

[robotistan.com](http://robotistan.com)

[aliexpress.com](http://aliexpress.com)

[ebay.com](http://ebay.com)

[dx.com](http://dx.com)



# Arduino Kit



must contain:

- Leds
- 7 segment display, LCD (16x2 or more)
- Bread-board
- Cables
- Stepper, servo and DC motor
- Relay
- Resistors
- Sensors (temperature, humidity, pressure, tilt, LDR, ...)
- RFid

# Example Kit

<http://www.aliexpress.com/item/For-Arduino-RFID-learning-suite-is-entry-to-the-master-suite-upgrade/1041872986.html>

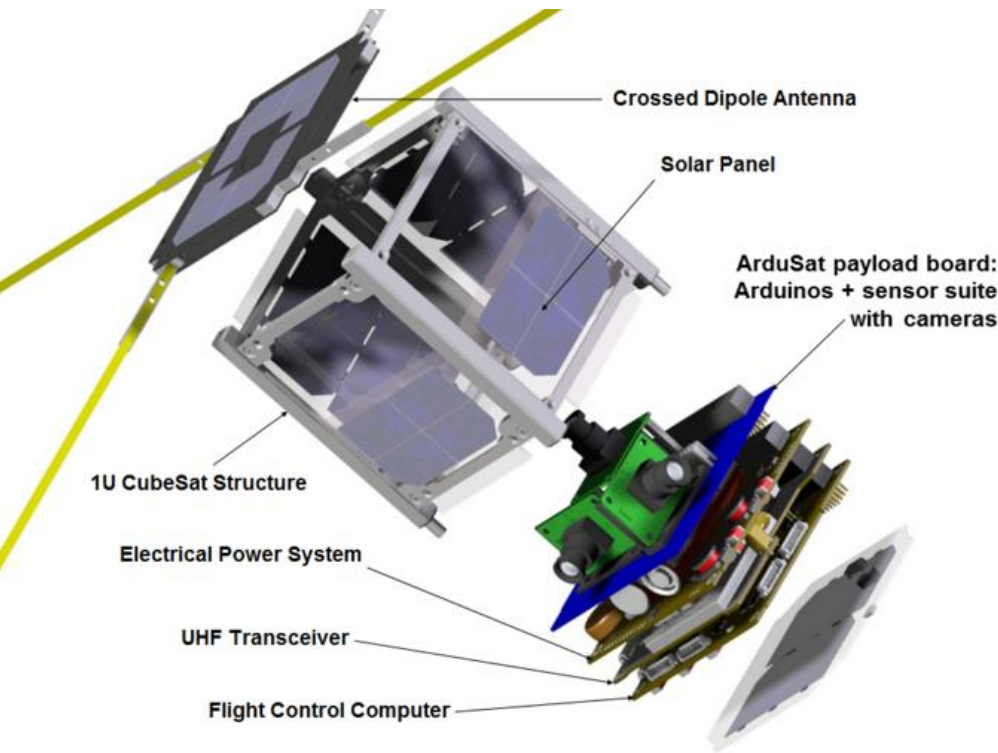


# ArduSat



<http://en.wikipedia.org/wiki/ArduSat>

- ArduSat is Arduino based Nanosatellite (Aug. 9, 2013).
- ArduSat is the first open source satellite which will provide such open access to the general public to space.



# ArduinoHand



<http://www.youtube.com/watch?v=ZYKoNi48m9o>

<http://www.youtube.com/watch?v=A4knNBvnSfE>

