

Project Kratos

Electronics

QSTP

Week 5 : Introduction to PCB Designing

This week we will be learning Eagle CAD software for designing PCBs. It is the most popular software used for this purpose due to its friendly user interface and due to its support for open source libraries. Learning to use all the tools of Eagle will not take more than a maximum 4-5 hours. However it is by doing practice that one excels in the art of PCB designing.

Before we jump to learning Eagle, it is important to know about some basic terminologies and concepts related to PCBs which might be helpful in future. Go through these links and it is totally fine if you are not able to understand some of the terms given on the webpage.

<https://www.youtube.com/watch?v=xiDPP2RGYDs> -(video)

<https://learn.sparkfun.com/tutorials/pcb-basics/all> -(text)

You can download Eagle software by AutoCAD by using this link:

<https://www.autodesk.in/products/eagle/free-download>

Designing a PCB is broken into two steps: 1) Designing PCB schematics

2) Designing board layout and routing

This week we will be focusing on the schematic part. Go through these links:

<https://learn.sparkfun.com/tutorials/using-eagle-schematic/all>

<https://www.autodesk.com/products/eagle/blog/schematic-basics-part-1/>

I also recommend you to watch this video in which most of the commonly used tools for designing schematics have been explained: <https://www.youtube.com/watch?v=1AXwjZoyNno>

Lastly in this week, we will learn to add external libraries to Eagle:

<https://core-electronics.com.au/tutorials/adding-to-your-eagle-component-library.html>

Assignment

1. Design a schematic of a circuit that takes voltage from xt60 and supplies it to 4 components using a PINHD-1X1 across the same voltage after passing through a step down transformer. Use an LM2596 voltage regulator.
2. This question will be familiar. 12 resistances are arranged on the edges of a cube. Draw a schematic for the arrangement when current enters from a corner and leaves from the diagonally opposite corner on the same face. You can use any non-variable resistor but if you're stuck go for RAC01 in resistor-power.
3. Design a schematic ,with an UNO-Arduino, that switches off a component when current exceeds a threshold. The circuit is powered from the input on an XT60. Use an ACS-712 current sensor ,an IRFZ44N MOSFET and PINHD-1X1.(assume that the Arduino is already coded.)
4. Design a schematic for a circuit that changes direction of a DC motor using DPDT Relay switch. Use XT60 for power input and PINHD-1X1 output to motor.
5. Design a schematic for the Q-4 of Assignment-1 from the first week. Use HLMP6 as the LEDs.

The deadline for this assignment is **15th June, 11:59pm**