



Course Name: Computer Engineering Workshop (CEN 1006)

LAB #2: Introduction to Lab Equipment/tools

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**Objective:**

- To get familiar with modern tools and equipment used in lab.
- To get familiar with construction of Ethernet cable and configuration of network.

### **Lab Tasks:**

- **Measure and note down the values of given resistors with the help of multimeter and color coding:**

- **Yellow, purple, red, and gold**

1. 4      7       $\times 100$        $\pm 5\%$
2.  $47 \times 100 \pm 5\%$
3.  **$4700\Omega \pm 5\%$**

- **Orange, white, brown, and gold**

1. 3      9       $\times 10$        $\pm 5\%$
2.  $39 \times 10 \pm 5\%$
3.  **$390\Omega \pm 5\%$**

- **Green, blue, yellow, and silver**

1. 5      6       $\times 10k$        $\pm 10\%$
2.  $56 \times 10000 \pm 10\%$
3.  **$560000\Omega \pm 10\%$  /  $560k\Omega \pm 10\%$**

- **Brown, black, green, and colorless**

1. 1      0       $\times 100k$        $\pm 0\%$
2.  $10 \times 100000 \pm 0\%$
3.  **$10000000\Omega \pm 0\%$  /  $10M\Omega \pm 0\%$**

- **Red, red, red, and gold**

1. 2    2     $\times 100$      $\pm 5\%$
2.  $22 \times 100 \pm 5\%$
3.  **$2200\Omega \pm 5\%$**

- **Design a resistor of value:**

- 33  $\Omega$ . (Hint 33 = 33  $\Omega$  x )

**Orange, Orange, Black and colourless**



- 750  $\Omega$ . (Hint 750  $\Omega$  = 75 x )

**Violet, Green, Brown and colourless**



- 43 k $\Omega$ . (Hint 43 k $\Omega$  = 43,000 = 43 x )

**Yellow, Orange, Orange and colourless**



### **Making of Ethernet Cable:**

To make an ethernet cable we need:

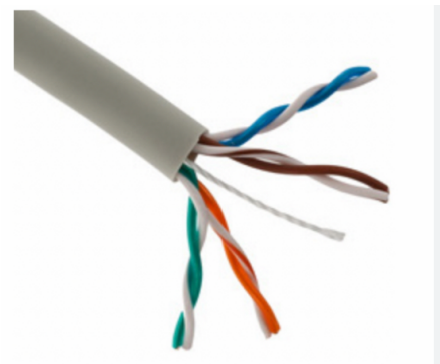
RJ45 Plug



Plug Crimper

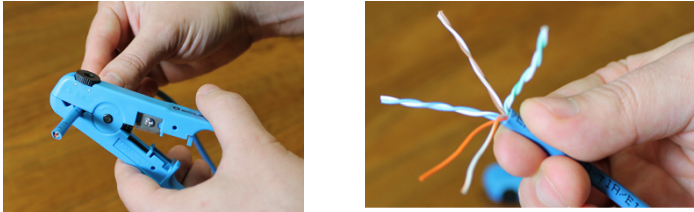


RJ45 cables

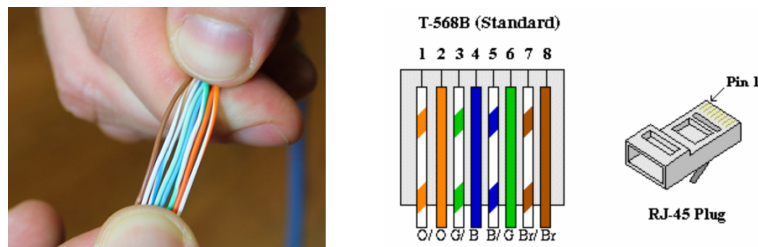


**Steps:**

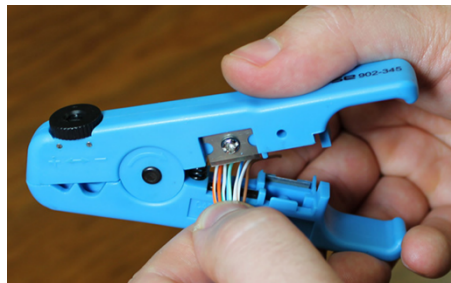
- First, we remove a small part of the white cover of the RJ45 cable to make the wires inside visible.



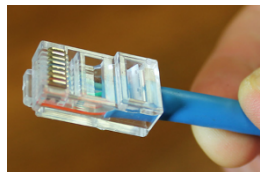
- Then we untangle the wires and set them in the correct order as shown below.



- After this we use the crimper to cut all the wires to equal lengths.



- Furthermore, we insert the wires in the plug and make sure the order is correct, and each wire is in its slot.



- Finally using the crimper, we place the plug in the desired crimp slot and squeeze it to form the connection. After creating the cable use the cable tester to test it is transmitting signals properly.



- Precaution: Once a plug is used in crimper it cannot be used again

**Conclusion:**

In this lab we have learned about how resistors are made using colour coding so we can identify them quickly and effectively. In addition to this we have learned how an ethernet plug is assembled which is used to transmit Wi-Fi signals without any interference. We were also told about the different machines present in our lab such as the 3D printing machine through which we can create the base structure of printed circuit boards. Raspberry pi and Arduino were also explained to inform us about their importance in automated electrical systems such as Air conditioners. The tasks in the lab have allowed us to understand how different modules are made and how they can be used which has enhanced our knowledge about electronics and computer-based systems.