

**INDIA TECHNOLOGY WEEK@HOME 2020**

Getting started with  
**Electronic Circuit Design**

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# Agenda:

- Introduction
- Components Overview
- Build Blocks
- Building Steps
- Choose IC
- Design Tips
- Design Sample
- Use of Softwares
- Q&A

# Introduction:

Hi everyone, Good afternoon. This is Samiuddhin. I am a freelance technical writer and hardware engineer based at Karaikal. I am contributing articles to EFY magazine and as a freelancer, I am developing real-time projects from client's idea.

In this webinar, I am going to share my knowledge on how to convert an idea to an electronic circuit. Electronic circuit design is a big concept and needs more time to know to get into it. However, I am explaining in short to cover all important points.

# Components Overview:

## *Resistor:*

- It limits the flow of current in a circuit.
- It is used in almost all electronic circuits for current limiting, biasing circuits, current sensing and many more.

## *Capacitor:*

- It stores electric energy in electrostatic field.
- It is used in power supplies, amplifier circuits, oscillators, power factor correction..etc.,

# Components Overview:

## *Inductor:*

- It stores electric energy in magnetic field..
- It is used in power supplies, oscillators, filters..etc.,

## *Diode:*

- It allows flow of current in only one direction.
- It is used in rectifiers, logic converter, voltage regulators, tuning circuits..etc.,

# Components Overview:

## *LED:*

- It is a type of diode which emits light when forward biased.
- It is used for lightning and indication purpose.

## *Relay:*

- It is a electro-mechanical switch.
- It is used in control panels, automation circuits..etc.,

# Components Overview:

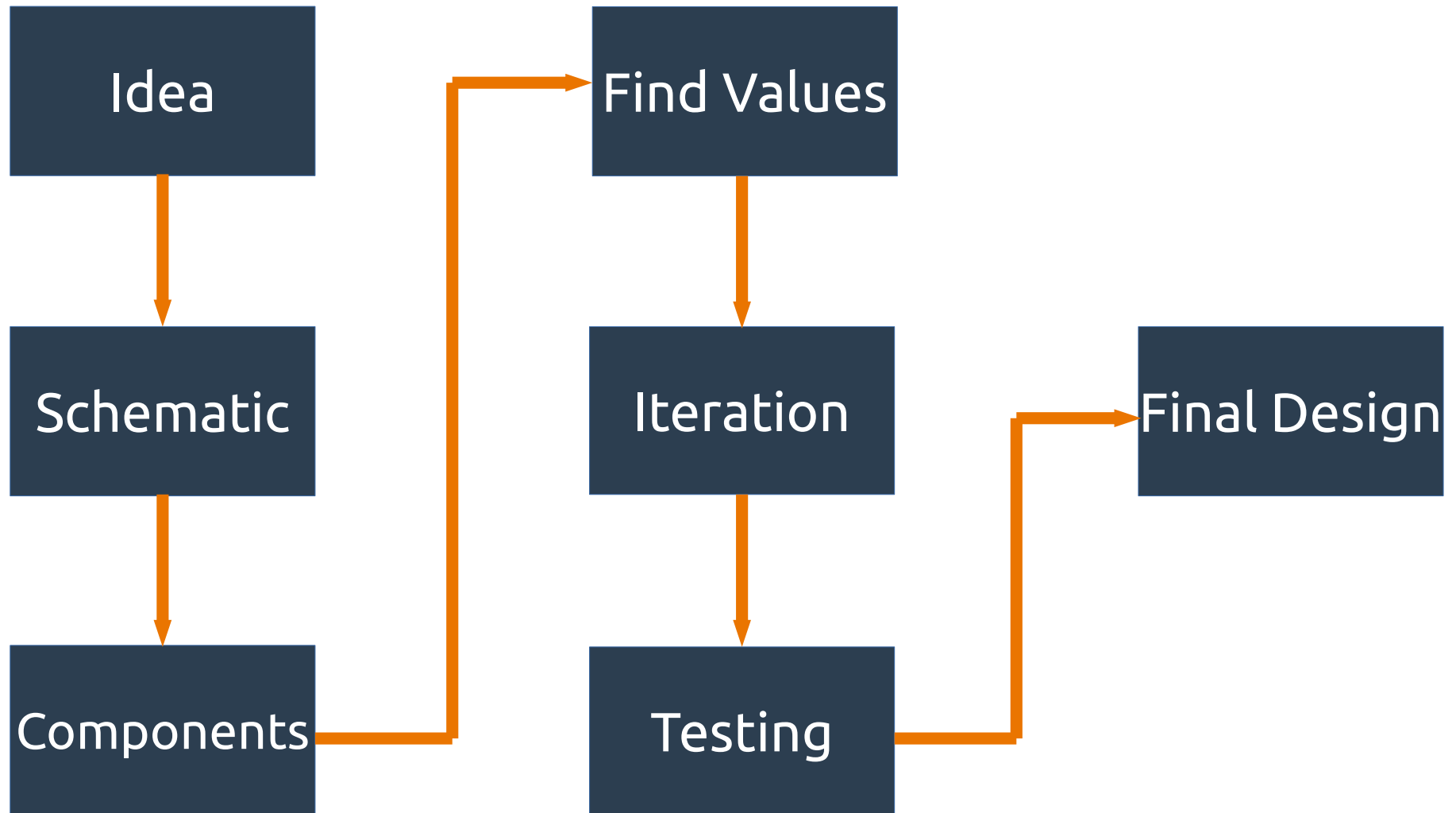
## *IC:*

- It is a collection of circuits in a single chip.
- It is used in almost all type of electronic circuits.

## *Breadboard:*

- It is a board with bunch of tiny holes.
- The tiny hole holds the electronic components terminal.
- It is used to test electronic circuits without using a regular PCB for testing and debugging purpose.

# Build Blocks:





# Building Steps:

To get start circuit design, you must complete the following steps.

- 1) Know the output and input parameters.
- 2) Choose the IC for your application(if needed).
- 3) Choose the sensors and microcontrollers (if needed).
- 4) Calculate the values of discrete components.
- 5) Draw the schematic layout using any EDA software.
- 6) Build the PCB layout using EDA software if required.

# Choose IC:

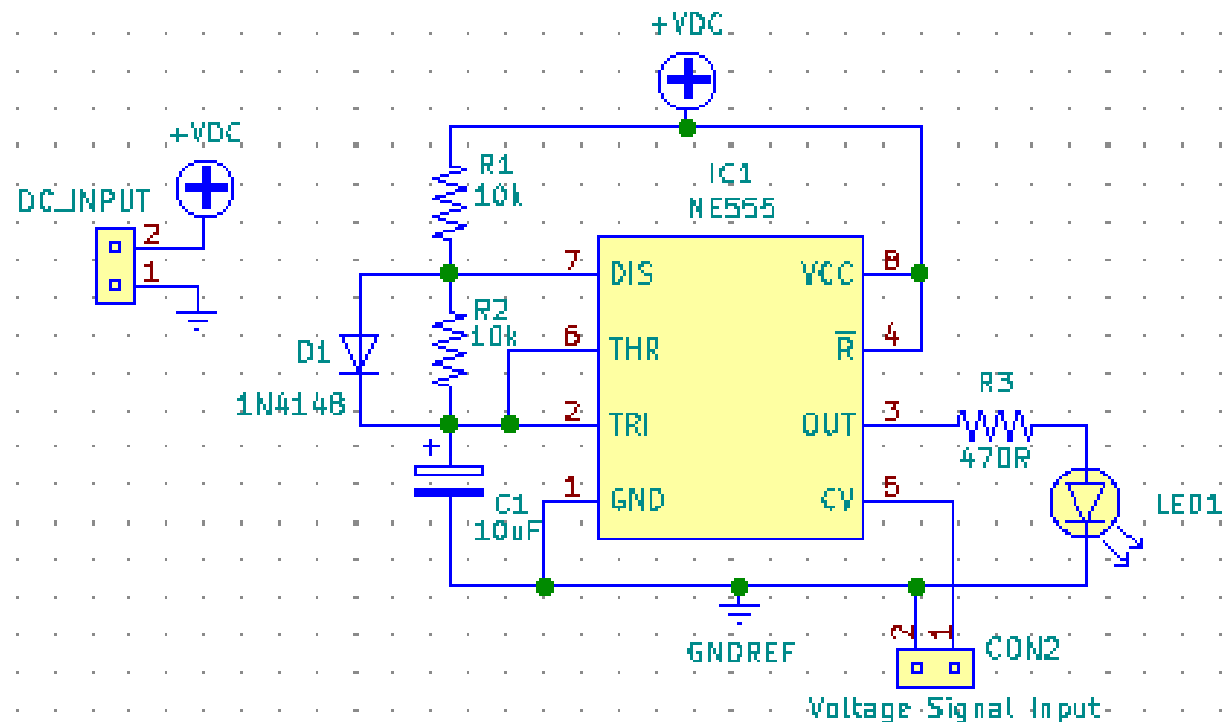
- First choose the IC category(power supply, data conv..etc.,)
- Choose the IC family(linear, switching, RS232-TTL..etc.,)
- Select the IC with your operating voltage range.
- Choose whether GP IC or ASIC suits your job.
- The IC should be cost effective.
- The package of IC should be best suite to your application.
- Read full datasheet and application notes to satisfy the operation of the IC fulfills your job.

# Design Tips:

- Coupling and decoupling caps.
- Use pull-up and pull-down resistors.
- Choose correct resistor wattage.
- Choosing right components.
- Use of unconnected pin/GPIO.
- Power on reset.
- Grounding.

# Design Sample:

Simple voltage controlled oscillator:



# Use of Software:

- Electronic Design Automation(EDA) plays a vital role in electronics design.
- EDA softwares are used to draw schematic and design PCB layouts.
- Design involves capture, netlist, footprint selection, board layout, design rule checking and 3D view.
- Some popular EDA's are gEDA, KiCAD, Proteus, Eagle..etc.,



**Any Questions..?**

**Thank you..!**