Process of Debugging a Circuit
Debugging

• Is a skill that you will have to develop so that you can trace errors in circuit design and construction rapidly.
  – It is not a process where you measure the output of the circuit while randomly replacing resistors or other components until the output signal is what you expected to see.
Debugging

• Start at the beginning of the circuit:
  – Make sure that your input voltage is correct.

• Find reasonably points within circuit to make measurements.
  – The measurements should be made sequentially from the beginning of the circuit to the output.

• Compare measured voltages with expected voltages obtained either through circuit analysis or simulation.
  • This means that you should do your calculations and simulations before you construct the circuit.
  – If they match reasonably well, move on to the next measurement point.
– If they don’t, do the simple things first:
  • Verify that power is on and connected at the right places (particularly V+ and V- on op amps).
  • Check component values.
  • Run through wiring to make sure that the wires are going where they are supposed to and nothing is accidently touching.
  • Make sure that your oscilloscope probes are connected to the correct points in the circuit.
  • Only if you are confident that you have everything above right, consider replacing a component.
    – If the circuit still doesn’t function properly, see the OpEL GTA, for assistance.