Fundamentals of Power Electronics
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Lecture - 15
Simulating the circuit

Today we will discuss a very important circuit which is the Diode Rectifier Capacitor Filter Circuit. Every power electronic equipment be at a low-power power electronic equipment or a high-power power electronic equipment ranging from few watts to megawatts you will find diode rectifier capacitor filter circuit in it. So, it becomes very important for us to understand the pros and cons of the diode rectifier capacitor filter circuit, how it operates, what are the issues involved and how to go about designing it. So, that is what we will focus on this week.

We will also use octave which is a clone of MATLAB for writing on the design equation, so that you can do iterative design. And for simulation we will use ngspice or at least I will show the simulation on ngspice, it is open source spice platform. I will be working on Linux; fedora Linux, but it does not matter which operating system you are using it may be windows or any other operate distribution of the Linux. You can appropriately use that simulation package that you are comfortable with.

LTspice is another nice simulation engine very fast and very good, you are encouraged to try that out. Pspice is also another simulation engine. If you are having MATLAB and simulink you can use simulink, sim power system to do your simulation exercises and learn more about the circuits. So, that is what we will be doing this week.

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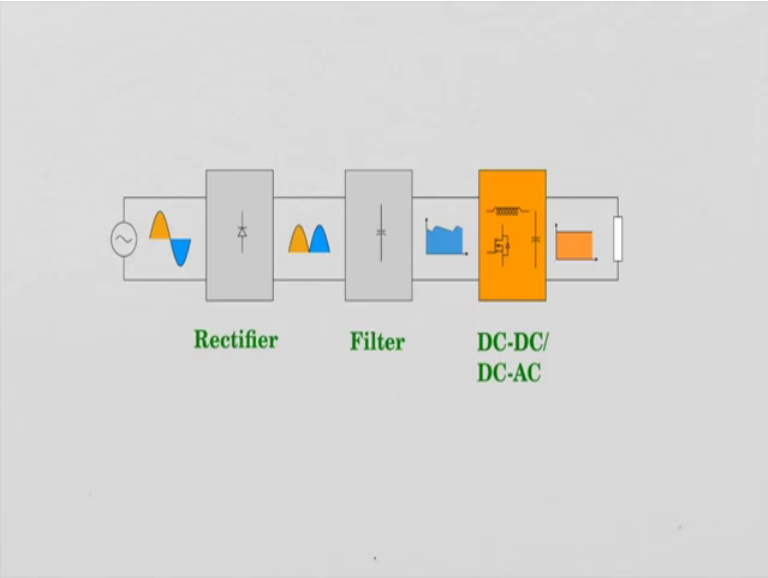

A typical power electronic system will look something like this. You have the AC source here it gives you an AC voltage. So, voltage source 230 volts and the power flows into rectifier which is normally a diode bridge rectifier get a rectifier output passes through a filter and the filter filters out the output voltage to a filter DC. The filter can be an LC filter or just AC filter and most cases it is just only AC filter.

The unregulated DC is passed through the core power electronic system which is a DC to DC converter or DC to AC inverter and the power flows through it to the output load which may be in the DC form or an AC form.

In this course we are going to discuss this entire power electronic system the various aspects of it and the various circuit that make up this. This week we will focus on the rectifier filter alone, that the capacitor rectifier filter circuit is what we will deal with now.