

## PPE201HIGH POWER CONVERTERS

<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>3.5</b>

**Course Objectives:** To impart knowledge about the. PWM schemes, understanding of current and voltage source inverters and multilevel converters, DC-DC converters and resonant inverters and their analysis with R, RL, RLE type of loads

**VOLTAGE SOURCE INVERTERS:** Three phase Inverters with star and delta connected loads, voltage control of three phase inverters: Performance parameters single, multi pulse, sinusoidal, space vector modulation techniques, Voltage control of single phase inverters using various PWM techniques , various harmonic elimination techniques. Multiple commutation & transformer connection , Harmonic filters, Application to drive system

**CURRENT SOURCE INVERTERS:** Operation of six-step thyristor inverter , inverter operation modes, load commutated inverters, Auto sequential current source inverter (ASCI) , current pulsations, comparison of current source inverter and voltage source inverters, PWM techniques for current source inverters.

**MULTILEVEL & BOOST INVERTERS:** Multilevel concept , diode clamped MLI, Flying capacitor MLI, Cascade/Series Hybrid Bridge type multilevel inverters, Modular Multilevel Conversion, Comparison of multilevel inverters, application of multilevel inverters , PWM techniques for MLI , Single phase & Three phase Impedance source inverters . Time sharing high frequency inverter , multipulse converters, their need analysis, various multipulse converter topologies, modulation techniques for multipulse inverters.

**RESONANT INVERTERS:** Series and parallel resonant inverters, voltage control of resonant inverters, Class E resonant inverter, resonant DC link inverters.

**Z-SOURCE INVERTER:** VSI versus CSI, Limitations of conventional converters, Z-source inverter topology, control techniques of Z-source inverters, Comparative performance analysis of control techniques of Z-source inverters

**Course Learning Outcome:**On the completion of the course, the student will be able

- To design the Gate and base drive circuits
- To develop skills to utilize the different PWM schemes
- To validate the performance of different types of inverters.
- To select the power converter for variety of applications

### **Recommended Books**

1. Bimal K.Bose “Modern Power Electronics and AC Drives”, Pearson Education, Second Edition, 2003.
2. Ned Mohan, T.M Undeland and W.P Robbin, “Power Electronics: converters, Application and design” John Wiley and sons. Wiley India edition, 2006.
3. Philip T. krein, “Elements of Power Electronics” Oxford University Press -1998.
4. P.C. Sen, “Modern Power Electronics”, Wheeler Publishing Co, First Edition, New Delhi, 1998.