

# Advanced Power Electronics (3-0-0)

## **Module I (12 Lectures)**

Switched Mode Power Supply:

Isolated switched mode power supplies, Forward converter, Fly back converter, Half bridge converter, Bridge converter, Push pull converter, Cuk converter, resonant converter, Switched mode power supply with multiple outputs

(1.5, 1.7 SMPS Design and Construction by H W Whittington, Universities Press)

Multi output Boost Converter, Diode rectifier fed boost converter, State space analysis of regulators.

(5.10, 5.11 and 5.13 Power Electronics, Circuits, Devices and Applications by M H Rashid, Pearson)

SMPS Control: Control requirements and technique, PWM controller, Isolation in the feed back loop, Power supplies with multiple outputs

(3.3 SMPS Design and Construction by H W Whittington, Universities Press)

## **Module II (12 Lectures)**

Inverters:

Voltage Fed Converters:

Pulse width modulation techniques, Sinusoidal PWM, Selected harmonic elimination PWM, Space vector PWM, Hysteresis band current control PWM, Sigma delta modulation Three level inverters, Resonant inverters, Soft switched inverters

Current Fed Converters:

Load commuted inverters, Forced commutated inverters, Inverters with self commutated devices

(5.5, 5.6, 5.7, 5.8, 5.9, 6.3, 6.4, 6.7, 6.7.2.2, 6.8 Modern Power Electronics and AC Drives by Bimal K Bose, Eastern Economy Edition, PHI)

## **Module III (12 Lectures)**

AC voltage controllers with PWM Control, Matrix Converter

(11.10, 11.11 Power Electronics, Circuits, Devices and Applications by M H Rashid, Pearson)

Application: High Voltage DC Transmission, Interconnection of renewable energy sources and energy storage system to the utility grid, Active harmonic filter

(11.4, 17.2, 17.4 Power Electronics: Converters , Applications and Design by Mohan, Undeland and Robbin, Wiley India Edition)

## **Text Books:**

- 1) Power Electronics: Circuits, Devices and Applications by M H Rashid, 3<sup>rd</sup> Edition, Pearson
- 2) Power Electronics: Converters , Applications and Design by Mohan, Undeland and Robbin, Wiley India Edition
- 3) Modern Power Electronics and AC Drives by Bimal K Bose, Eastern Economy Edition, PHI.
- 4) Switched Mode Power Supplies: Design and Construction by H W Whittington, B.W Flynn and D E Macpherson, 2<sup>nd</sup> Edition, Universities Press)