

PEL7J002 ADVANCED POWER ELECTRONICS 3-0-0

MODULE- I

[10 Hrs]

University Portion(80%): (8 Hrs)

1. Switched Mode Power Supply:

Isolated switched mode power supplies, Forward converter, Fly back converter, Half bridge converter, Full bridge converter, Push pull converter, Switched mode power supply with multiple outputs.

Text Book- 1- Ch- [14.2.1,14.2.2,14.2.3,14.2.4,14.2.5,14.2.6]

2. Resonant Converters:

Series Resonant Converters, Parallel Resonant Converters.

Text Book- 1- Ch- [8.2,8.4]

College/Institute Portion(20%): (2 Hrs)

Zero current switching, Zero voltage switching. [Text Book-1- Ch-[8.8,8.9]. Or related advanced topics as decided by the concerned faculty teaching the subject.

MODULE- II

[10 Hrs]

University Portion(80%): (8 Hrs)

3. Regulators:

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

Text Book- 1- Ch-[5.8.2,5.8.3,5.10,5.11,5.13]

4. SMPS Control:

Control requirements and technique, PWM controller, Isolation in the feed back loop, Power supplies with multiple output.

Text Book- 1- Ch- [14.3,14.5]

College/Institute Portion(20%): (2 Hrs)

Buck regulator, Cuk regulator. . Text Book- 1- Ch-[5.8.1,5.8.4]. Or related advanced topics as decided by the concerned faculty teaching the subject.

MODULE- III

[10 Hrs]

University Portion(80%): (8 Hrs)

5. 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

6. Current Fed Converters:

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

Text Book-3- Ch-[5.5, 5.6,5.7,5.8,5.9,6.3,6.4,6.7,6.7.2.2,6.8]

College/Institute Portion(20%): (2 Hrs)

Applications of these converters. Or related advanced topics as decided by the concerned faculty teaching the subject.

7thSemester

MODULE- IV

[10 Hrs]

University Portion(80%): (8 Hrs)

7. AC voltage controllers: AC voltage controllers with PWM Control, Matrix Converter.
8. Application: High Voltage DC Transmission, Interconnection of renewable energy sources and energy storage system to the utility grid, Active harmonic filter.

Book-1- Ch- 11.10,11.11

Book-2- Ch- 11.4, 17.2, 17.4

College/Institute Portion(20%): (2 Hrs)

Related advanced topics as decided by the concerned faculty teaching the subject.

Text Books:

- 1) Power Electronics: Circuits, Devices and Applications by M H Rashid, 3rd 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.

Reference Books:

- 1) Switched Mode Power Supplies: Design and Construction by H W Whittington, B.W Flynn and D E Macpherson, 2nd Edition, Universities Press)