| Course Code EPE-814 | Credit Hours (Th-Pr) 3.0-0 | **Advanced Power Electronics[1] (Elective)** | Contact Hrs/Week (Th-Pr) 3.0-0 | Total Contact Hrs (Th-Pr) 45-0 |
|---|---|---|---|---|

**Course Outline:**

1. Power electronics converters are the backbone of any energy conversion system e.g. for renewable integration and for power quality etc. The course on Advanced Power Electronics is formulated for the graduate students to provide them with the analytical and control design skills in the power electronics.

**Eligibility Criteria:**

2. B.E ( Electrical Engineering)

**Recommended Books**:

| S. No. | Title | Author(s) | Assigned Code | Remarks |
|---|---|---|---|---|
| 1. | Fundamentals of Power Electronics | R.W. Erickson, D. Maksimovic | R.E | Text |
| 2. | Power Electronics: Converters, Applications and Design | N. Mohan, T.M. Undeland, W.P. Robbins | R.T | Reference |
| 3. | Power Electronics: A First Course on Power Electronics | N. Mohan | N.M | Reference |

**Course Objectives:**

3. The major objective of this course is to enable the students to have design-oriented analysis of topologies and control methods for various basic and advanced power electronic converters used for dc-dc, dc-ac and ac-dc power conversions in important applications

**Learning outcome:**

[1] The contents of this course are same as offered at ASU by Prof. R.Ayyanar

4. At the end of the course student will have sound understanding of ‘dc-dc converters and power management’ and ‘PWM dc-ac/ac-dc converters at relatively higher power levels

**Topics Covered:**

| No. | Topics | Text Book | Contact Hours |
|---|---|---|---|
| 1. | Principles of Steady State Converter Analysis | RE | 3 |
| 2. | Steady State Equivalent Circuit Modeling | RE | 3 |
| 3. | Dynamic Equivalent Modeling | RE | 7 |
| 4. | Gate Drive | RE | 1 |
| 5. | □-controller Interfacing | RE | 1 |
| 6. | Discontinuous Conduction Mode (DCM) | RE | 4 |
| 7. | Dynamic Equivalent Modeling in DCM | RE | 4 |
| 8. | Switch Realization | RE | 2 |
| 9. | Characteristics of Semiconductor Switches | RE | 3 |
| 10. | Converter Topologies | RE | 2 |
| 11. | Isolated Converters | RE | 3 |
| 12. | Control System Design | RE | 6 |
| 13. | PWM Techniques | RE | 4 |
| 14. | Power & Harmonics in Non-Sinusoidal Systems | RE | 2 |