Course outcomes: After studying this course, students will be able to:
- Acquire knowledge of Dynamic memory allocation, Various types of data structures, operations and algorithms and Sparse matrices and Hashing
- Understand non Linear data structures trees and their applications
- Design appropriate data structures for solving computing problems
- Analyze the operations of Linear Data structures: Stack, Queue and Linked List and their applications

Text Book:

Data structures, Algorithms, and applications in C++, Sartaj Sahni, Universities Press, 2nd Edition, 2005.

Reference Books:
1. **Data structures, Algorithms, and applications in C++,** Sartaj Sahni, Mc. Graw Hill, 2000.
2. **Object Oriented Programming with C++,** E.Balaguruswamy, TMH, 6th Edition, 2013.
3. **Programming in C++,** E.Balaguruswamy. TMH, 4th, 2010.

POWER ELECTRONICS
B.E., VI Semester (Open Elective)
[As per Choice Based Credit System (CBCS) scheme]

Subject Code	15EC662	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	40 (08 Hours / Module)	Exam Hours	03
CREDITS – 03			

Course Objectives: This course will enable students to
• Understand the working of various power devices.
• Study and analysis of thyristor circuits with different triggering techniques.
• Learn the applications of power devices in controlled rectifiers, converters and inverters.
• Study of power electronics circuits under different load conditions.

Module-1	RBT Level
Introduction - Applications of Power Electronics, Power Semiconductor Devices, Control Characteristics of Power Devices, types of Power Electronic Circuits. Power Transistors: Power BJTs: Steady state characteristics. Power MOSFETs: device operation, switching characteristics, IGBTs: device operation, output and transfer characteristics. (Text 1)	L1, L2
Module-2	
Thyristors - Introduction, Principle of Operation of SCR, Static Anode-Cathode Characteristics of SCR, Two transistor model of SCR, Gate Characteristics of SCR, Turn-ON Methods, Turn-OFF Mechanism, Turn-OFF Methods: Natural and Forced Commutation – Class A and Class B types, Gate Trigger Circuit: Resistance Firing Circuit, Resistance capacitance firing circuit. (Text 2)	L1, L2, L3
Module-3	
Controlled Rectifiers - Introduction, principle of phase controlled converter operation, Single phase full converters, Single phase dual converters. AC Voltage Controllers - Introduction, Principles of ON-OFF Control, Principle of Phase Control, Single phase control with resistive and inductive loads. (Text 1)	L1, L2, L3
Module-4	
DC-DC Converters - Introduction, principle of step-down operation and it's analysis with RL load, principle of step-up operation, Step-up converter with a resistive load, Performance parameters, Converter classification, Switching mode regulators: Buck regulator, Boost regulator, Buck-Boost Regulators. (Text 1)	L1, L2
Module-5	
Pulse Width Modulated Inverters- Introduction, principle of operation, performance parameters, Single phase bridge inverters, voltage control of single phase inverters, current source inverters, Variable DC-link inverter, Boost inverter. (Text 1)	L1, L2

Course outcomes: After studying this course, students will be able to:

- Describe the characteristics of different power devices and identify the applications.
- Illustrate the working of DC-DC converter and inverter circuit.
- Determine the output response of a thyristor circuit with various triggering options.
- Determine the response of controlled rectifier with resistive and inductive loads.

Evaluation of Internal Assessment Marks:

It is suggested that at least a few experiments of Power Electronics are conducted by the students for better understanding of the course. This activity can be considered for the evaluation of 5 marks out of 20 Internal assessment marks, reserved for the other activities.

Question paper pattern:

- The question paper will have ten questions
- Each full question consists of 16 marks.
- There will be 2 full questions (with a maximum of Three sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module
- The students will have to answer 5 full questions, selecting one full question from each module

Text Book:

1. Mohammad H Rashid, Power Electronics, Circuits, Devices and Applications, 3rd/4thEdition, Pearson Education Inc, 2014, ISBN: 978-93-325-1844-5.

2. M.D Singh and K B Khanchandani, Power Electronics, 2nd Edition, Tata Mc-Graw Hill, 2009, ISBN: 0070583897.

Reference Books:

1. L. Umanand, Power Electronics, Essentials and Applications, John Wiley India Pvt. Ltd, 2009.
2. Dr. P. S. Bimbhra, "Power Electronics", Khanna Publishers, Delhi, 2012.
3. P.C. Sen, "Modern Power Electronics", S Chand & Co New Delhi, 2005.