



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Third year Bachelors of Engineering (EE)
 With effect from: Academic Year 2019-20

Subject Code: EE605-N	Subject Title: Power Electronics-II
Pre-requisite	

Course Objective:

- To present a problem oriented introductory knowledge of power electronics.
- To focus on the study of electrical parameters & different engineering application based principles.
- To address the underlying concepts & methods of power electronics.

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE Marks	CIA Marks	Pract. Marks	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks				
03	00	02	05	04	03	70	30	20	30	150

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction	05
2	DC to AC Converters (Inverter)	15
3	AC Voltage Controllers	10
4	Cycloconverters	10
5	Application of Power Electronics	05

Total Hours (Theory): 45

Total Hours (Lab): 30

Total Hours: 75



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Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	Introduction: Review of power semiconductor devices: Thyristor, IGBT, MOSFET, and GTO	05	10
2	DC to AC Converters (INVERTERS): Introduction, Classification, single phase half and full bridge VSI, three phase VSI 120 and 180 degree conduction mode. Performance Parameters of Inverter, Voltage control of single phase and three phase Inverter, Series inverter, Parallel inverter.	15	30
3	AC Voltage Controllers: Introduction, Principal of On-Off control and Phase Control, Single phase Bidirectional Controllers with R and R-L Loads.	10	25
4	Cycloconverters: Single Phase midpoint step up and step down Cycloconverter, Single Phase bridge type step up and step down Cycloconverter	10	20
5	Application of Power Electronics: UPS, AC Voltage Regulators.	05	15
	Total	45	100

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and laboratory, which may carry five marks in overall evaluation.
- One internal exam of 30 marks is conducted as a part of mid semester evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry a weight age of five marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar /Tutorial may be conducted and having share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.



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Learning Outcome

On successful completion of the course, students will be able to

- suggest converter topology based on application
- analyze and implement various control techniques for power electronic converters
- evaluate various performance parameters of inverter

TEXT BOOKS:

1. P.S. Bimbhra, “*Power Electronics*” Khanna Publishers.

REFERENCE BOOKS:

1. Rashid, M. H., “*Power Electronics Circuits, Devices, and Application*”, Pearson.
2. Ned Mohan, Tore M. Undeland and William P. Robbins, ‘*Power Electronics Converters, Applications, and Design*’, John Willey & Sons.
3. Sen P.C., “*Thyristor DC drives*”, John wiley and sons.
4. B.K. Bose, “*Modern Power Electronics and AC drives*”, Pearson (Prentice-Hall)
5. L Umanand, “*Power Electronics: Essentials & Applications*”, Wiley India.

Suggested List of Experiments:

Sr. No.	Name of experiment
1.	To perform 1-phase half bridge Inverter on R load.
2.	To perform 1-phase full bridge Inverter on R load.
3.	To perform 180-degree and 120-degree mode of conduction for Inverter.
4.	To perform AC voltage controller with Phase angle control and Integral cycle control.
5.	To perform 1-phase step down and step up Cycloconverter.
6.	To study online and offline UPS
7.	To study firing circuit of SCR
8.	Minor Project based on Power Electronics involving switching of MOSFET.