



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN – PART I

Name of the Programme and Specialization	M.Tech. – Power Electronics		
Course Title	POWER CONVERTERS & DRIVES LAB		
Course Code	EE658	No. of Credits	02
Course Code of Prerequisite subject(s)	-		
Session	JANUARY 2023	Section (if, applicable)	M.Tech,PE
Name of Faculty	Dr. M Sahoo	Department	EEE
Email	sahoo@nitt.edu	Telephone No.	0431-2503274
Name of Course Coordinator(s) (if, applicable)	-		
Course Type	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Laboratory course	

Syllabus (approved in BoS)

To simulate, test and analyse the following Power Electronic Circuits:

List of Experiments

- Single- Phase and Three- Phase Controlled Rectifier
- Single- Phase Inverter
- Three- Phase Inverter (120° and 180° modes of operation)
- DC – DC Converters
- Phase Controlled Circuits
- DC and AC Circuit Breakers
- Mini Project

COURSE OBJECTIVES

To enable the Power System students to get an insight into the basic Power Electronic Circuits

COURSE OVERVIEW

Power Electronics can be considered as the technology associated with the conversion, control and conditioning of electric power from its available form to the desired electrical form, by the application of power semiconductor devices. Power Electronics will play a dominant role in the 21st century in industrial and utility applications with increased emphasis on energy saving and efficient control of industrial processes thereby helping to preserve the environment. The primary goal of this course is to give an in-depth laboratory experience in design, and simulation of power converters. Various power electronic converters are simulated in the laboratory to explore the characteristics of switching devices and its application in various power converters namely, dc-dc, dc-ac, ac-dc and ac-ac converters and its application to Electric Drives.

MAPPING OF COs (Course Outcomes) with POs (Programme Outcomes)

Upon completion of the course, the student will be able to

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
CO1: Test and analyze the basic rectifier and inverter circuits	2	-	-	-	-	-	-	3	-	-	2	1	-	1
CO2: Test and analyze controlled circuits	3	-	-	-	-	-	-	2	-	-	1	-	-	1
CO3: Design basic Power Electronic Control Circuits for Power system applications	3	-	-	-	-	-	-	2	-	3	2	-	-	1



COURSE TEACHING AND LEARNING ACTIVITIES				
S.No.	Week/Contact Hours	Topic	Mode of Delivery	
1	Week 1	Introduction to the laboratory and experiments	Simulation/Experiment	
2	Week 2-5	Design and simulation of DC-DC Buck and Boost Converter and its closed loop control	Simulation/Experiment	
3	Week 5-8	Design and simulation of DC-AC Inverters and its closed loop control	Simulation/Experiment	
4	Week 9-10	Design and simulation of V/f control of Induction motor drive	Simulation/Experiment	
5	Week 11-12	Design and Simulation of AC-DC converter with PFC control	Simulation/Experiment	
6	Week 13	Compensation Lab	Simulation/Experiment	
7	Week 16/17/18 08.05.2023 to 18.05.2023	<i>Final Assessment</i>	-	
COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-1 Internal Assessment (Results, Viva-Voce, Documentation)	Weekly	-	40
2	Assessment-2 (Mini-Project)	will be conducted along with the course		20
CPA	Compensation Assessment	Week 16	One session	Maximum 20%
3	Final Assessment	02/05/2023 – 04/05/2023	3 Hrs	40
COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)				
<ul style="list-style-type: none"> • Feedback from the students during class committee meetings • Anonymous feedback through questionnaire (Mid of the semester & End of the semester) • End semester feedback on Course Outcomes 				
COURSE POLICY (including compensation assessment to be specified)				
<ol style="list-style-type: none"> 1. Attending all the assessments mandatory for every student 2. One compensation assessment will be conducted for those students who are being physically absent for the assessment 1 and/or 2, only for the valid reason. 3. At any case CPA will not be considered as an improvement test. 4. Absolute/Relative grading will be adopted for the course. 				
ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)				
<ul style="list-style-type: none"> ➤ At least 75% attendance in each course is mandatory. ➤ A maximum of 10% shall be allowed under On Duty (OD) category. ➤ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade. 				
ACADEMIC DISHONESTY & PLAGIARISM				
<ul style="list-style-type: none"> ➤ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty. ➤ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark. ➤ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office. ➤ The above policy against academic dishonesty shall be applicable for all the programmes. 				
ADDITIONAL INFORMATION, IF ANY				



FOR APPROVAL

Course Faculty

Dalav

CC- Chairperson

Shelb

HOD

Sharma
08/02/23



Guidelines

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.