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Estd : 1999

JNTUH College Code : 86



**MOTHER THERESSA COLLEGE OF ENGINEERING & TECHNOLOGY**

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P.P.Colony (Po.), Peddabonkuru (Vill), PEDDAPALLI (Mdl. & Dist.) - 505174, Telangana State.

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## COURSE FILE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

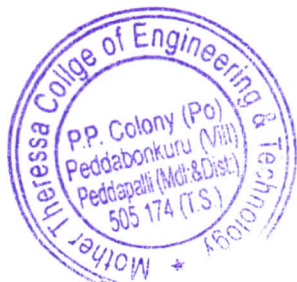
REGULATIONS : R18

YEAR / SEM : III B.TECH – I SEM

COURSE : POWER ELECTRONICS (EE501PE)

FACULTY NAME: K KUMAR

DESIGNATION: ASSOC. PROF



*T. Seeni*

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# COURSE FILE ON POWER ELECTRONICS (EE501PE) III B. TECH I SEM



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Approved by AICTE, New Delhi & Affiliated to JNTUH Hyderabad)

P.P.Colony (Po), Peddabonkur(Vill), Peddapalli - 505174

**A.Y 2022- 2023**



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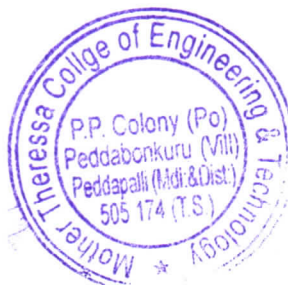
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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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1	Vision and Mission of the Institution and Department
2	Program Educational Objectives
3	Program Outcomes
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11	JNTUH and Department Academic calendar
12	Lesson Plan
13	Lecture notes
14	University Question papers of previous years
15	I Mid question papers
16	I Mid answer scripts
17	II Mid question papers
18	II Mid answer scripts



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### ABOUT THE INSTITUTION

Mother Theresa college of Engineering & Technology is Sponsored by Bishop Solomon Educational Society, established in the year of 1999 by our Founder chairman Sri.Adavalli Krishna garu, an Eminent Educationalist and presently running under the chairmanship of Sri Adavalli Naveen Kumar Garu, an young Technocrat. Their vision must be appreciated here for setting up a good engineering institution in a place like Peddapalli to bring higher education opportunities at the door steps of the rural people. Now the college has 24 academic years of excellence and shaped into one of the best colleges in Telangana. College is located in prime location of Peddapalli Town of Peddapalli District just beside New Integrated Collector Complex.

Our college started in 1999 at Peddapally with 3 B.Tech Programs with a total intake of 180 and in these 24 academic years developed to one among the top colleges in Northern Telangana. Our college has a well-planned campus with pollution free environment and has emerged as a pioneer venture in the field of Technological education.

Now the college runs with UG, PG & Diploma courses. B.Tech with highest no. of courses (8) in the district. (ECE, CSE, EEE, MECHANICAL, CSIT, CSM (AI&ML), DATA SCIENCE & CYBER SECURITY courses) , M.TECH courses (EPS, CSE, DS&CE, IEM), MBA, DIPLOMA courses (EEE, MECH, CME & MINING, ECE )

### VISION

To flourish as a centre of excellence for producing the skilled technocrats and committed human beings

### MISSION

IMI: To create conducive environment for teaching & learning.



*T. Seenaiah*

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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### ABOUT DEPARTMENT:

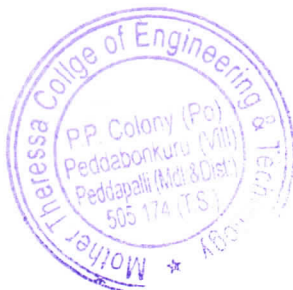
The Department of Electrical and Electronics Engineering in ABIT was established in 2008, offering under graduate in B.Tech in Electrical and Electronics Engineering. The prime objective of the course is to advance the student ability to use techniques, skills, and modern engineering tools necessary in Electrical Engineering practices

#### Vision:

The Department of Electrical and Electronics Engineering will provide program of the highest quality to produce globally competent technocrats who can address challenges of the millennium to achieve sustainable socio- economic development

#### Mission:

- M1: To facilitate quality learning blended with practical engineering skills
- M2: To prepare students to develop all round competitiveness with globally competency
- M3: To motivate faculty and students to do impactful research on societal needs



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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### PROGRAMME EDUCATIONAL OBJECTIVES (PEO's):

The Programme Educational Objectives (PEOs) of the department program in tune with the Vision and Mission of the department are:

##### **PEO 1:**

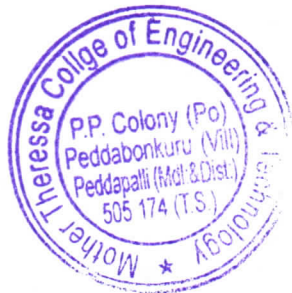
To enhance the ability of students to design electrical, electronic and computing systems that are innovative and socially acceptable

##### **PEO 2:**

To motivate the students to exhibit professionalism, practical engineering skills, communication skills and team work

##### **PEO3:**

To motivate the students and faculty to do useful and application-oriented research



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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### PROGRAMME OUTCOMES(POs)

Engineering Graduates will be able to

**PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.



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PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest



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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### PROGRAMME SPECIFIC OBJECTIVES (PSOs)

Electrical and Electronics Engineering Graduates will be able to

**PSO1:** Apply the knowledge of Mathematics and Science in Electrical and Electronics Engineering and adapt to a challenging environment through individual and team work.

**PSO2:** Design, analyse and evaluate the performance of Electrical system using latest tools and gain sufficient competence to solve the problems in the electrical energy sector with future perspective considering socio-economic aspects.

**PSO3:** Develop the expertise in the technology for efficient operation and control of Electrical system with ethical responsibility and effective communication to engage in lifelong learning for a successful career.



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### Syllabus Copy

R18 B.Tech. EEE Syllabus

JNTU HYDERABAD

#### EE501PE: POWER ELECTRONICS

B.Tech. III Year I Sem.

L	T	P	C
3	1	0	4

**Prerequisite:** Analog Electronics, Digital Electronics

**Course Objectives:**

- To Design/develop suitable power converter for efficient control or conversion of power in drive applications
- To Design / develop suitable power converter for efficient transmission and utilization of power in power system applications.

**Course Outcomes:** At the end of this course students will demonstrate the ability to

- Understand the differences between signal level and power level devices.
- Analyze controlled rectifier circuits.
- Analyze the operation of DC-DC choppers.
- Analyze the operation of voltage source inverters.

#### UNIT - I:

**Power Switching Devices:** Concept of power electronics, scope and applications, types of power converters; Power semiconductor switches and their V-I characteristics - Power Diodes, Power BJT, SCR, Power MOSFET, Power IGBT; Thyristor ratings and protection, methods of SCR commutation, UJT as a trigger source, gate drive circuits for BJT and MOSFETs



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**UNIT - II:**

**AC-DC Converters (Phase Controlled Rectifiers):** Principles of single-phase fully-controlled converter with R, RL, and RLE load, Principles of single-phase half-controlled converter with RL and RLE load, Principles of three-phase fully-controlled converter operation with RLE load, Effect of load and source inductances, General idea of gating circuits, Single phase and Three phase dual converters

**UNIT - III:**

**DC-DC Converters (Chopper/SMPS):** Introduction, elementary chopper with an active switch and diode, concepts of duty ratio, average inductor voltage, average capacitor current. Buck converter - Power circuit, analysis and waveforms at steady state, duty ratio control of output voltage. Boost converter - Power circuit, analysis and waveforms at steady state, relation between duty ratio and average output voltage. Buck-Boost converter - Power circuit, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

**UNIT - IV:**

**AC-DC Converters (Inverters):** Introduction, principle of operation, performance parameters, single phase bridge inverters with R, RL loads, 3-phase bridge inverters - 120- and 180-degrees mode of operation, Voltage control of single-phase inverters –single pulse width modulation, multiple pulse width modulation, sinusoidal pulse width modulation

**UNIT - V:**

**AC-AC Converters:** Phase Controller (AC Voltage Regulator)-Introduction, principle of operation of single-phase voltage controllers for R, R-L loads and its applications. Cyclo-converter-Principle of operation of single phase cyclo-converters, relevant waveforms, circulating current mode of operation, Advantages and disadvantages.

**TEXT BOOKS:**

1. M. H. Rashid, "Power electronics: circuits, devices, and applications", Pearson Education India, 2009.
2. N. Mohan and T. M. Undeland, "Power Electronics: Converters, Applications and Design", John Wiley & Sons, 2007

**REFERENCE BOOKS:**

1. R. W. Erickson and D. Maksimovic, "Fundamentals of Power Electronics", Springer Science & Business Media, 2007
2. L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.



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CO2: Analyze controlled rectifier circuits.

CO3: Analyze the operation of DC-DC choppers.

CO4: Analyze the operation of voltage source inverters.



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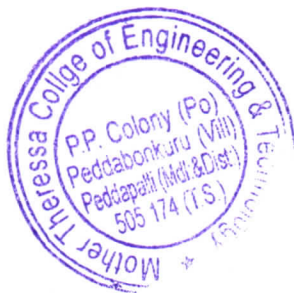
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES MAPPING WITH PO's & PSO's :

CO's	PROGRAM OUTCOMES(PO's)												PROGRAM SPECIFIC OUTCOMES(PSO's)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	3	-	-	-	-	-	2	-	1	3	2	2
CO2	3	3	3	2	-	-	-	-	-	2	-	1	3	2	2
CO3	3	3	3	3	-	-	-	-	-	2	2	2	3	3	2
CO4	3	3	3	2	-	-	-	-	-	2	3	2	2	3	2



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III B.Tech I Sem EEE-A Nominal Roll List

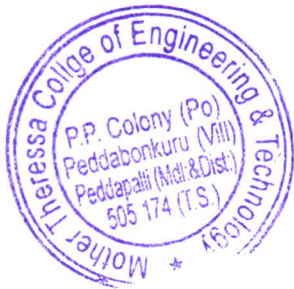
A.Y : 2022-23

SNO	PIN NO	NAME OF THE STUDENT
1	20861A0201	BANOTH AKSHITHA
2	20861A0202	JAMMI DHEERAJ
3	20861A0203	SIRIGIRI SUVARTHA
4	20861A0204	THOGITI VINEETH KUMAR
5	20861A0205	MEKALA JAYAKRISHAN
6	21865A0201	BABBERA SAI KUMAR
7	21865A0202	BANDARI SAI RAJ
8	21865A0203	BUTHUKURI SREE HARSHA
9	21865A0204	ENAGANDULA AKASH
10	21865A0205	GADDAM PAVAN
11	21865A0207	GUMMULA NARESH
12	21865A0208	INDARAPU SAGAR
13	21865A0209	KAILASAKOTI SAI BHARGAV
14	21865A0210	KASIPETA PUJITHA
15	21865A0213	MEKALA ANVESH
16	21865A0214	MORA VIJAY
17	21865A0215	MUDAM RAVITEJA
18	21865A0216	MYAKALA DINESH
19	21865A0217	NAGUNURI SHREYA
20	21865A0218	NALI BIKSHAPATHI
21	21865A0219	NETHAVATH GANESH
22	21865A0220	NOOTHI ARAVIND



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20	21865A0218	NALLI BIKSHAPATHI
21	21865A0219	NETHAVATH GANESH
22	21865A0220	NOOTHI ARAVIND
23	21865A0221	PONAGANTI ASHWINI
24	21865A0223	SHAIK RASHID ZUNATH
25	21865A0225	THOKALA SPANDANA
26	21865A0226	ALLAVENI KALYAN



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### III EEE - I SEM

A.Y:2022-2023

W.E.F: 09/09/2002

Day/Period	1	2	10:05-10:55	10:55-11:05	11:05-11:55	11:55-12:45	12:45-1:30	1:30-2:20	2:20-3:10	3:10-4:00
MON	PE	MI	BREAK	BREAK	3	4	LUNCH	5	6	7
TUE	PS-II	PE LAB			HVE	BEFA		PS-II	PE	COUNSELLING
WED	HVE	PE			PS-II	BEFA		MI	IPR	HVE
THU	MI	ACS			ACS / MI LAB	BEFA		HVE	IPR	IPR
FRI	BEFA	MI			PE	PS - II		MI / ACS LAB	PE	SPORTS
SAT	HVE	BEFA	MI	PS - II	PS - II	MI / ACS LAB	PSS / PE LAB			

CLASS TEACHER: 1. R RAJITHA

2. A PRATHIBA

S.NO	SUBJECT	STAFF ALLOTTED
1	POWER ELECTRONICS	K KUMAR
2	POWER SYSTEMS - II	A PRATHIBA
3	MEASUREMENTS AND INSTRUMENTATION	R RAJITHA
4	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	E DEVENDER
5	HIGH VOLTAGE ENGINEERING	B SOUNDARYA
6	POWER SYSTEMS - II LAB	A PRATHIBA
7	MEASUREMENTS AND INSTRUMENTATION LAB	R RAJITHA
8	ADVANCED COMMUNICATION AND SKILLS LAB	APSARA BEGUM
9	INTELLECTUAL AND PROPERTY RIGHTS	DR. D AMBICA

**Head of the Department**

Electrical & Electronics Engineering

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**III EEE - I SEM A.Y:2022-2023**

W.E.F: 09/09/2002

Day/Period	9:15-10:05	10:05-10:55	10:55-11:05	11:05-11:55	11:55-12:45	12:45-1:30	1:30-2:20	2:20-3:10	3:10-4:00
MON	1 PE	2	BREAK	3	4	LUNCH	5	6	7
TUE		PE			PE LAB				
WED		PE							
THU								PE	
FRI				PE					
SAT									PSS / PE LAB

*R. Rajitha*  
FACULTY INCHARGE

*S*  
HOD - EEE

*T. Geeserika*  
PRINCIPAL

**In-charge of the Department**  
Electrical & Electronics Engineering  
MOTHER THERESSA  
College of Engineering & Technology  
PEDDAPALLI-505 174 (T.S.)

**PRINCIPAL**  
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College of Engineering & Technology  
PEDDAPALLI-505 174.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

ACADEMIC CALENDAR 2022-23

B. Tech./B. Pharm. III YEAR I & II SEMESTERS

I SEM

S. No	Description	Duration	
		From	To
1	Commencement of I Semester classwork	09.09.2022	
2	1 <sup>st</sup> Spell of Instructions (including Dussehra Recess)	09.09.2022	10.11.2022 (9 Weeks)
3	Dussehra Recess	03.10.2022	08.10.2022 (1 Week)
4	First Mid Term Examinations	11.11.2022	17.11.2022 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	24.11.2022	
6	2 <sup>nd</sup> Spell of Instructions	18.11.2022	12.01.2023 (8 Weeks)
7	Second Mid Term Examinations	16.01.2023	21.01.2023 (1 Week)
8	Preparation Holidays and Practical Examinations	23.01.2023	28.01.2023 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	30.01.2023	
10	End Semester Examinations	30.01.2023	11.02.2023 (2 Weeks)

Note: No. of Working/ instructional days: 92

II SEM

S. No	Description	Duration	
		From	To
1	Commencement of II Semester classwork	13.02.2023	
2	1 <sup>st</sup> Spell of Instructions	13.02.2023	08.04.2023 (8 Weeks)
3	First Mid Term Examinations	10.04.2023	15.04.2023 (1 Week)



*T. Sreenivas*

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 PEDDAPURAM

Counselling Code : MTEC

Estd : 1999

JNTUH College Code : 86



## MOTHER THERESSA COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by A.I.C.T.E, New Delhi & Affiliated to J.N.T.U Hyderabad)

P.P.Colony (Po.), Peddabonkuru (Vill), PEDDAPALLI (Mdl. & Dist.) - 505174, Telangana State.

Website : [www.mtec86.ac.in](http://www.mtec86.ac.in) E-mail: [mtec.86@gmail.com](mailto:mtec.86@gmail.com) Contact : +919849472523 , +91 9542709545, +91 9989959556.

### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Date : 27/08/2022

The Department of EEE academic calendar for II, III and IV years of B.Tech I and II semesters Regulars for the academic year 2022-23 is Approved.

S.NO	I SEMESTER	DURATION
1	Commencement of I semester class works for IV B.Tech	29/08/2022
2	Commencement of I semester class works for III B.Tech	09/09/2022
3	Value added certificate program for III, IV Years	12/09/2022 to 17/09/2022
4	I mid-term exams for IV B.Tech students	01/11/2022 to 07/11/2022
5	I mid-term exams for III B.Tech students	11/11/2022 to 17/11/2022
6	Commencement of I semester class works for II B.Tech	28/11/2022
7	Guest lecturer for II Year class	30/11/2022
8	II mid-term exams for IV B.Tech students	04/01/2023 to 10/01/2023
9	Practical exams for IV B.Tech students	11/01/2023 to 19/01/2023
10	II mid-term exams for III B.Tech students	16/01/2023 to 21/01/2023
11	End semester exams for IV B.Tech students	21/01/2023 to 02/02/2023
12	I mid-term exams for II B.Tech students	23/01/2023 to 30/01/2023
13	Practical exams for III B.Tech students	23/01/2023 to 28/01/2023
14	End semester exams for III B.Tech students	30/01/2023 to 11/02/2023
15	II mid-term exams for II B.Tech students	31/03/2023 to 08/04/2023
16	Practical exams for II B.Tech students	10/04/2023 to 15/04/2023
17	End semester exams for II B.Tech students	17/04/2023 to 29/04/2023

S.NO	II SEMESTER	DURATION
1	Commencement of II semester class works for IV B.Tech students	03/02/2023
2	Commencement of II semester class works for III B.Tech students	13/02/2023
3	Guest lecturer for II Year class	18/02/2023



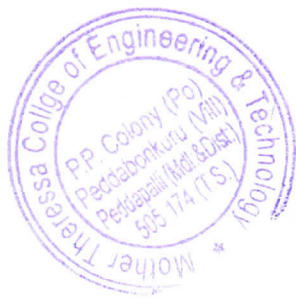
*T. Sreenivas*  
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4	Value added certificate program for III, IV B.Tech students	13/03/2023 to 18/03/2023
5	I mid-term exams for IV B.Tech students	01/04/2023 to 08/04/2023
6	I mid-term exams for III B.Tech students	10/04/2023 to 15/04/2023
7	Commencement of II semester class works for II B.Tech	01/05/2023
8	Summer vacation	15/05/2023 to 27/05/2023
9	II mid-term exams for IV B.Tech students	19/06/2023 to 24/06/2023
10	II mid-term exams for III B.Tech students	26/06/2023 to 01/07/2023
11	Practical exams and preparation for IV B.Tech students	26/06/2023 to 01/07/2023
12	Practical exams and preparation for III B.Tech students	03/07/2023 to 08/07/2023
13	End exams for IV B.Tech students	03/07/2023 to 15/07/2023
14	I mid-term exams for II B.Tech students	10/07/2023 to 15/07/2023
15	End exams for III B.Tech students	10/07/2023 to 22/07/2023
16	II mid-term exams for II B.Tech students	12/09/2023 to 16/09/2023
17	Practical exams and preparation for II B.Tech students	19/09/2023 to 23/09/2023
18	End exams for II B.Tech students	25/09/2023 to 07/10/2023

HOD-EEE

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### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING LESSON PLAN

Faculty name	: K KUMAR	Dept.	: EEE
Subject name	: POWER ELECTRONICS	Code	: EE501PE
Year	: III B.TECH	Semester	: I
Degree and branch	: B.TECH & EEE	Academic year	: 2022-23

S.No	Dates	Topic to be Covered	PPT/BB/ OHP/ e-material	No of Hrs.	Resource
<b>UNIT - I</b>					
1	12/9/22	Concept of Power electronics	BB	1	R1, T2
2	13/9/22	Scope and applications	BB	1	R1, T2
3	14/9/22	Types of power converters	BB	1	R1, T2
4	16/9/22	Power conductor switches ad its V-I characteristics	BB	1	R1, T2
5	19/9/22	Power Diode and its V-I characteristics	BB	1	R1, T2
6	20/9/22	Power BJT and its V-I characteristics	BB	2	R1, T2
7	22/9/22	Silicon controlled rectifier(SCR) and its V-I characteristics	BB	1	R1, T2
8	23/9/22	Switching and gate characteristics of SCR	BB	1	R1, T2
9	26/9/22	Ratings of SCR	BB	1	R1, T2
10	27/9/22	Protection of SCR	BB	1	R1, T2
11	29/9/22	Power MOSFET and its V-I characteristics	PPT	1	R1, T2
12	10/10/22	Power IGBT and its V-I characteristics	PPT	1	R1, T2
13	11/10/22	Gate drive circuits for MOSFET and IGBT, UJT as triggering source	BB	1	R1, T2
14	12/10/22	Methods of SCR commutations	BB	2	R1, T2
<b>UNIT - II</b>					
15	15/10/22	Introduction to Phase controlled rectifier	PPT	1	R2, T2
16	17/10/22	Single phase half wave-controlled rectifier with R, RL load	BB	2	R2, T2
17	18/10/22	Single phase center tapped full wave-controlled rectifier with R, RL load	BB	1	R2, T2
18	19/10/22	Single phase full controlled rectifier with R, RL,RLE load	PPT	1	R2, T2
19	21/10/22	Single phase semi controlled rectifier with R, RL,RLE load	BB	2	R2, T2
20	22/10/22	Numerical problems	BB	1	R2, T2
21	25/10/22	Three phase full controlled rectifier with R, RL, RLE load	BB	1	R2, T2
22	26/10/22	Effect of load and source inductances	BB	1	R2, T2
23	27/10/22	Single phase dual converter	BB	1	R2, T2



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24	28/10/22	Three phase dual converter	BB	1	R2, T2
25	29/10/22	Numerical problems	BB	1	R2, T2
<b>UNIT - III</b>					
26	31/10/22	Introduction to chopper and Duty Cycle	BB	1	R1, R2
27	1/11/22	Control strategies -TRC and CLC	BB	1	R1, R2
28	2/11/22	Step down and step up chopper	PPT	1	R1, R2
29	4/11/22	Numerical problems	BB	2	R1, R2
30	5/11/22	Buck converter	BB	1	R1, R2
31	8/11/22	Boost converter	BB	1	R1, R2
32	9/11/22	Buck -Boost converter	PPT	1	R1, R2
33	19/11/22	Type A, Type B choppers	BB	1	R1, R2
34	21/11/22	Type C, Type D choppers	BB	1	R1, R2
35	23/11/22	Four quadrant choppers	BB	1	R1, R2
36	24/11/22	Numerical problems	BB	1	R1, R2
<b>UNIT - IV</b>					
37	28/11/22	Principle of operation of Inverter	BB	1	T1, T2
38	29/11/22	Single phase Half and Full bridge inverters with R Load	BB	1	T1, T2
39	1/12/22	Single phase Half and Full bridge inverters with RL Load	BB	1	T1, T2
40	3/12/22	Numerical problems	BB	1	T1, T2
41	6/12/22	3-phase bridge inverters - 120° mode of operation	PPT	1	T1, T2
42	8/12/22	3-phase bridge inverters - 180° mode of operation	PPT	1	T1, T2
43	9/12/22	Numerical problems	BB	1	T1, T2
44	12/12/22	Voltage control of single-phase inverters	BB	1	T1, T2
45	14/12/22	Single pulse width modulation & multiple pulse width modulation	BB	2	T1, T2
46	16/12/22	Sinusoidal pulse width modulation	BB	1	T1, T2
47	19/12/22	Numerical problems	BB	1	T1, T2
<b>UNIT - V</b>					
48	22/12/22	Principle of operation of single-phase voltage controllers for R Load	BB	1	R2, T1
49	28/12/22	Principle of operation of single-phase voltage controllers for RL Load	BB	1	R2, T1
50	29/12/22	Numerical problems	BB	2	R2, T1
51	31/12/22	Applications of Phase controlled AC voltage controller	PPT	1	R2, T1
52	4/01/23	Principle of operation of single phase step up cyclo-converters	PPT	2	R2, T1
53	6/01/23	Principle of operation of single phase step up cyclo-converters	PPT	2	R2, T1
54	9/01/23	Circulating current mode of operation of cyclo-converters	PPT	1	R2, T1

**Faculty In charge**

**HOD - EEE**

**PRINCIPAL**

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**Head of the Department**  
Electrical & Electronics Engineering  
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