Gokaraju Rangaraju Institute of Engineering and Technology
(Autonomous)
Bachupally, Kukatpally, Hyderabad– 500 090, T.S, India. (040)66864440

Course Title: Power Electronics LAB (GR20A3021)
Following documents are available in Course File.

S.No.	Points	Yes	No
1	Institute and Department Vision and Mission Statements	√	
2	Academic Calendar	√	
3	Subject Allocation Sheet	√	
4	Class Time Table, Individual Timetable (Single Sheet)	√	
5	Syllabus Copy	√	
6	Course Handout	√	
7	CO-PO Mapping	√	
8	Assignment Questions with CO's		√
9	Tutorial Sheets With Solution		√
10	Sessional Question Papers, External Question Paper and Scheme of Evaluation		√
11	Previous University Question Papers		√
12	Best, Average and Weak Answer Scripts for Each Sessional Exam. (Photocopies)	√	
13	CO-PO Attainments for All Mids.		
14	Soft Copy of Notes/Ppt/Slides		√
15	Feedback From Students	√	
16	Result Analysis	√	
17	Remedial Action.		
18	Course Exit Survey		√

Course Instructor / Course Coordinator

Course Instructor / Course Coordinator

Vision of the Institute:

To be among the best of the institutions for engineers and technologists with attitudes, skill and Knowledge and to become an epicentre of creative solutions.

Mission of the Institute:

To achieve and impart quality education with an emphasis on practical skills and social relevance.

Vision of the Department:

To impart technical knowledge and skills required to succeed in life, career and to help society to achieve self-sufficiency.

Mission of the Department:

- To become an internationally leading department for higher learning.
- To build upon the culture and values of universal science and contemporary education.
- To be a centre of research and education generating knowledge and technologies which lay groundwork in shaping the future in the fields of electrical and electronics engineering.
- To develop partnership with industrial, R&D and government agencies and actively participate in conferences, technical and community activities.

1. PEO and PO's (B.Tech)

1. Programme Educational Objectives (PEOs):

PEO-1: Graduates will have a successful technical or professional career, including supportive and leadership roles on multidisciplinary teams.

PEO-2: Graduates will be able to acquire, use and develop skills as required for effective professional practices.

PEO-3: Graduates will be able to attain holistic education that is an essential prerequisite for being a responsible member of society.

PEO-4: Graduates will be engaged in life-long learning, to remain abreast in their profession and be leaders in our technologically vibrant society.

2. Programme Outcomes (POs):

PO-1: Ability to apply knowledge of mathematics, science, and engineering.

PO-2: Ability to identify, formulate, analyze engineering problems using engineering sciences.

PO-3: Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety..

PO-4: Ability to design and conduct experiments, as well as to analyze and interpret data with valid conclusions.

PO-5: Ability to utilize experimental, statistical and computational methods and tools necessary for modelling engineering activities.

PO-6: Ability to apply reasoning informed by the relative knowledge to evaluate societal, health, safety, legal and cultural issues and tasks applicable to the professional engineering practice.

PO-7: Ability to adapt broad education necessary to understand the impact of engineering solutions and obtain sustainability in a global, economic, environmental, and societal context.

PO-8: Ability to discover ethical principles and bind to professional and ethical responsibility.

PO-9: Ability to function as an individual and in multi-disciplinary teams.

PO-10: Ability to communicate effectively on complex activities in engineering community and society.

PO-11: Ability to develop Project management principles and apply in various disciplinary environments.

PO-12: Recognition of the need for, and an ability to engage in life-long learning

3. Program Specific Outcomes (PSOs):

PSO-1: Graduates will interpret data and able to analyze digital and analog systems related to electrical and programming them.

PSO-2: Graduates will able to demonstrate, design and model electrical, electronic circuits, power electronics, power systems and electrical machines.

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GRIET/DAA/1H/G/22-23 19 July 2022

Academic Calendar
Academic Year 2022-23

III B.Tech. – First Semester

S. No.	EVENT	PERIOD	DURATION
1	Commencement of First Semester class work	08-08-2022	
2	I Spell of Instructions	08-08-2022 to 08-10-2022	9 Weeks
3	I Mid-term Examinations	10-10-2022 to 13-10-2022	3 Days
4	II Spell of Instructions	14-10-2022 to 12-12-2022	9 Weeks
5	II Mid-term Examinations	13-12-2022 to 15-12-2022	3 Days
6	Preparation	16-12-2022 to 22-12-2022	1 Week
7	End Semester Examinations (Theory/ Practical) Regular/ Supplementary	23-12-2022 to 13-01-2023	3 Weeks
8	Commencement of Second Semester, AY 2022-23	16-01-2023	

III B.Tech. – Second Semester

S. No.	EVENT	PERIOD	DURATION
1	Commencement of Second Semester class work	16-01-2023	
2	I Spell of Instructions	16-01-2023 to 16-03-2023	9 Weeks
3	I Mid-term Examinations	17-03-2023 to 20-03-2023	3 Days
4	II Spell of Instructions	21-03-2023 to 29-04-2023	6 Weeks
5	Summer Vacation	01-05-2023 to 20-05-2023	3 Weeks
6	II Spell of Instructions Contd	22-05-2023 to 12-06-2023	3 Weeks
7	II Mid-term Examinations	13-06-2023 to 15-06-2023	3 Days
8	Preparation	16-06-2023 to 22-06-2023	1 Week
9	End Semester Examinations (Theory/ Practical) Regular / Supplementary	23-06-2023 to 15-07-2023	3 Weeks
10	Commencement of IV B.Tech First Semester, AY 2023-24	17-07-2023	

Dean Academic Affairs

Copy to Principal, All HoDs, CoE

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Electrical and Electronics Engineering

GRIET/PRIN/06/G/01/22-23

BTech - EEE - A

Wef : 08th Jul 2022

III Year - I Semester

DAY/ HOUR	9:00 - 9:55	9:55- 10:50	10:50 - 11:45	11:45 -12:25	12:25-1:15	1:15 - 2:05	2:05 -2:55
MONDAY	PE	PE	EHV	BREAK	PE Lab (A1)/PS Lab (A2)		
TUESDAY	CC	MC	MC		PSA	PSA	Library
WEDNESDAY	MC	PSA	Mentoring		PS Lab (A1)/MC Lab (A2)		
THURSDAY	PSA	PSA	PE		MC Lab (A1)/PE Lab (A2)		
FRIDAY	EHV	EHV	CC		Library	MC	MC
SATURDAY	CC	PE	PE		Library	EHV	EHV

ROOM NO	
Theory/Tutorial	4402
Lab	PE Lab (4405) MC Lab (4502) PS Lab (4504)
Class Incharge:	G. Sandhya Rani

Subject Code	Subject Name	Faculty Code	Faculty Name	Almanac	
GR20A3012	Power Systems Analysis (PSA)	Dr JSD	Dr J. Sridevi	1st Spell of Instructions	08-08-2022 to 08-10-2022
GR20A3013	Power Electronics (PE)	Dr PB	Dr Pakkiraiah B	1st Mid-term Examinations	10-10-2022 to 13-10-2022
GR20A3014	Microprocessors and Microcontrollers (MC)	Dr DR	Dr D Raveendhra	2nd Spell of Instructions	14-10-2022 to 18-12-2022
GR20A3015	Electrical and Hybrid Vehicles (EHV)	Dr DGP	Dr D. G. Padhan	2nd Mid-term Examinations	09-12-2022 to 13-12-2022
	Cloud Computing (CC)	PRK	P. Ravikanth	Preparation	14-12-2022 to 20-12-2022
GR20A3020	Power Systems Lab (PS Lab)	Dr JSD/ VUR/UVL	Dr J. Sridevi/ V. Usharani/ U. Vijayalakshmi	End Semester Examinations (Theory/ Practicals) Regular / Supplementary	21-12-2022 to 10-01-2023
GR20A3021	Power Electronics Lab (PE Lab)	Dr PB/GSR/MRE	Dr. B. Pakkiraiah/G. Sandhya Rani/M Rekha		
GR20A3022	Microprocessors and Microcontrollers Lab (MC Lab)	Dr PSVD/MNSR	Dr. P. Srividya Devi/ M. N. Sandhya Rani	Commencement of Second Semester, A.Y 2022-2023	16-01-2023

Time Table Coordinator

HOD

DAA

COs	Cognitive Learning Levels					
	1	2	3	4	5	6
1			√			
2		√				
3				√		
4						√
5					√	

Cognitive Learning Levels

CLL 1: Remembering
CLL 2: Understanding
CLL 3: Applying
CLL 4: Analyzing
CLL 5: Evaluating
CLL6: Creating

Gokaraju rangaraju Institute of Engineering and Technology

III B.Tech I sem 2022-23 PE Lab

Room No: 4405

DAY/ HOUR	9:00-9:55	9:55-10:50	10:50-11:45	11:45-12:25	12:25-1:15	1:15-2:05	2:05-2:55
MONDAY					PE LAB		
TUESDAY				LUNCH			
WEDNESDAY							
THURSDAY					PE Lab		
FRIDAY							
SATURDAY							

Lab Incharge **HOD, EEE**

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Electrical and Electronics Engineering

2022 -23 I sem Subject allocation sheet

II YEAR(GR20)	Section-A	
Electrical Circuit Analysis	G Sandhya Rani	
Principles of Analog Electronics	P Ravikanth	
DC Machines and Transformers	Dr Phaneedra Babu B	
Electromagnetic Fields	Dr T Suresh Kumar	
Power Generation and Transmission	V Vijaya Rama Raju	
Java Programming for Engine	CSE Dept. Staff	
Constitution of India	D Karuna Kumar	
Value Ethics and Gender Culture	M Prashanth	
Principles of Analog Electronics Lab	U Vijaya Lakshmi/ M Prashanth	
DC Machines and Transformers Lab	V Vijaya Rama Raju / M Rekha	
III YEAR (GR20)	Section-A	
Power System Analysis	Dr J Sridevi	
Power Electronics	Dr Pakkiraiah B	
Microproces sors and Microcontrol lers	Dr D Raveedhra	
Electrical and Hybrid Vehicles (PE-1)	Dr D G Padhan	
Cloud Computing (NPTEL)	P Ravikanth	
Power Systems Lab	Dr J Sridevi / V Usha Rani/ U Vijaya Lakshmi	
Power Electronics Lab	Dr Pakkiraiah B/ G Sandhya Rani	
Microproces sors and Microcontrol lers Lab	Dr P Srividya Devi/ M N Sandhya Rani	
IV YEAR(GR18)	Section-A	Section-B
Power Systems – III	Dr P Srividya Devi	P Prashant h Kumar
Electronics Design	Dr D S N M Rao	Dr D S N M Rao
Electrical and Hybrid Vehicles (PE-III)	D Srinivasa Rao	D Srinivasa Rao
High Voltage Engineering (PE-IV)	A Vinay Kumar	A Vinay Kumar
Robotics	Anitha (Mech)	
Database Management Systems	D Swathi (CSE)	
Electronics Design Lab	P Ravikanth /Dr DSNM Rao	D Karuna Kumar/ V Usha Rani

Project work - (PhaseI)	A Vinay Kumar/ D Srinivasa Rao	M N Sandhya Rani / G Sandhya Rani
I/I BEE(GR20)	Theory	LAB
EEE (1) BEE	R Anil Kumar/ P Praveen Kumar / P Prashanth Kumar/ K Sudha	
ECE (3) BEE		
IT (3) BEE		
CSBS (1) PEE		
Design Thinking	Dr D G Padhan	
Mech II/I (GR20)	A	
BEEE	M N Sandhya Rani	

Dr Phaneendra Babu B
HOD,EEE

List of Experiments: (PE Lab-GR20A3021)

1. Characteristics of SCR, IGBT, MOSFET.
2. R, RC and UJT firing circuits.
3. Single-phase Half Controlled Converter with R-load.
4. Single-phase Fully Controlled Converter with R-load.
5. Open loop analysis of Buck Converter.
6. Open loop analysis of Boost Converter.
7. Performance analysis of Single-phase Full Bridge Inverter with R & RL load.
8. Performance analysis of Single-phase Cyclo-Converter with R & RL load.
9. Practical validation of Three Phase Fully Controlled Converter.
10. Practical validation of Three Phase Fully Controlled Converter.
11. Operation of Three Phase Half Controlled Converter using Simulation.
12. Operation of Buck-Boost Converter using Simulation.
13. Performance and analysis of speed control of single-phase Induction Motor using simulation.

GR20A3021-POWER ELECTRONICS LAB														
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1. Choose appropriate switching devices & firing circuits based on	M				M	H	M	H	M	M	H	H	M	
2. Design and analyze the operation of power switching converters.	M	M	M	M	M		H		H	M	H	H	M	H
3. Develop practical control circuits for various real time	H	H		H	M		M	M	H	H	H	H	M	H
4. Analyze and evaluate the operation of Inverters & Cyclo		M	M				M	H	M		H	H	M	
5. Judge power electronic converter performance for various			H		M		M	M	M	H	H	H		H

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COURSE OBJECTIVES

Academic Year : 2022-2023

Semester : I

Name of the Program: B. **Year: III Section: A**

Course/Subject: Power Electronics Lab **Course code: GR20A3021**

Name of the Faculty: Dr.Pakkiraih.B, G.Sandhya Rani, **Dept.: EEE.**

On completion ofthis Subject/Course the studentshallbe able:

S.No	Objectives
1	Develop hands-on experience in analyzing, designing and carrying out experiments on various power converters.
2	Familiarize with switching devices and their applications in power control.
3	Familiarize with power converters in various systems for power control.
4	Analyze and simulate different Converters using Simulation.
5	Conduct experiments with converters and compare the results with theoretical concepts and simulations.

Signature of HOD Signature of faculty

Date: Date:

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COURSE OUTCOMES

Academic Year : 2022-2023

Semester : I

Name of the Program: B. **Year: III Section: A**

Course/Subject: Power Electronics Lab **Course code: GR20A3021**

Name of the Faculty: Dr.Pakkiraih.B, G.Sandhya Rani, **Dept.: EEE**

Theexpected outcomesofthe Course/Subjectare:

S.No	Outcomes
1	Choose appropriate switching devices & firing circuits based on their characteristics and application
2	Design and analyze the operation of power switching converters
3	Develop practical control circuits for various real time applications.
4	Analyze and evaluate the operation of Inverters & Cyclo converters.
5	Judge power electronic converter performance for various applications in virtual platforms and AC Voltage controllers.

Signature of HOD Signature of faculty

Date: Date:

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COURSESCHEDULE

Academic Year : 2022-2023

Semester : I

Name of the Program: B. **Year: III Section: A**

Course/Subject: Power Electronics Lab **Course code: GR20A3021**

Name of the Faculty: Dr.Pakkiraih.B, G.Sandhya Rani, **Dept.: EEE**

THE SCHEDULE FOR THE WHOLE COURSE/ SUBJECT IS:

Sl.No	Topics	No of periods
1	Introduction	3
2	Introduction to Power Semiconductor Devices	3
3	Introduction to MATLAB	3
4	Characteristics of SCR, IGBT, MOSFET	3
5	R, RC, UJT firing Circuits	3
6	Single Phase Half Controlled Converter with R-load	3
7	Single Phase Full Controlled Converter with R-load	3
8	Open loop analysis of Buck Converter	3
9	Open loop analysis of Buck Converter	3
10	Performance analysis of Single-Phase Full Bridge Inverter with R & RL loads	3
11	Performance analysis of Single-Phase Cyclo-Converter with R & RL loads	3
12	Practical Validation of Three Phase Fully Controlled Converter	3
13	Operation of Single Phase AC Voltage Controller	3
14	Operation of Three Phase Half Controlled Controller Converter	3

	Using Simulation.	
15	Operation of Buck-Boost Converter Using Simulation	3
16	Performance and analysis of speed control single-phase Induction Motor Using Simulation.	3

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EVALUATIONSTRATEGY

Academic Year : 2022-2023

Semester : I

Name of the Program: B. **Year: III Section: A**

Course/Subject: Power Electronics Lab **Course code: GR20A3021**

Name of the Faculty: Dr.Pakkiraih.B, G.Sandhya Rani, **Dept.: EEE**

1. TARGET:

A) Percentageforpass:**100%**

2. COURSEPLAN&CONTENT DELIVERY

(Pleasewritehowyouintendtocoverthecontents:i.e.,coverageofUnits/Lessonsbylectures,design,exercises, solvingnumericalproblems,demonstrationofmodels,modelpreparation,experimentsin theLab orbyassignments, etc.)

3. METHOD OF EVALUATION

3.1 ☐ Daily Attendance

3.2 ☐ Lab Record and Observation

3.3 ☐ Projects

3.4 ☐ Viva Voce

3.5 ☐ InternalExamination

4.Listoutanynewtopic(s)oranyinnovationyou wouldliketointroduceinteachingthesubjectsinthisSemester.

Gokaraju Rangaraju Institute of Engineering &

Technology III B.Tech I Sem (EEE) Result Analysis

AcademicYear:2022-23 Total No. of Students Registered:65

Course	Total No. of Students appeared	Total No. of Students Passed	No. of Students Failed	Count of Students with Grade Point					
				GP (10)	GP (9)	GP(8)	GP (7)	GP(6)	GP (5)
PSA	65	50	15	00	00	12	10	14	14
PE	65	50	15	00	02	06	12	19	11
MPMC	65	47	18	00	01	09	08	12	17
EHV	65	60	05	00	05	14	20	15	06
PS-I Lab	65	63	02	10	19	07	03	13	11
PE Lab	65	64	01	22	11	15	10	06	00
MPMC Lab	65	64	01	07	11	21	16	08	01
Cloud Computing (MOOCs)									

Arrears Position – III year / I Semester

No.of students	All Pass	One Arrear	Two Arrears	Three Arrears	More than three arrears	Overall % of pass
65	38	11	09	03	04	58.46 %

Performance overall Class Three Toppers

ROLL NO.	NAME	SGPA
20241A0235	RAMINENI VYSHNAVI	8.53
21245A0201 21245A0206	JAKINAPALLI CHANDHANA VEMULA SATYANARAYANA	8.43
20241A0248 20241A0257 21245A0205	UMMIDISETTY NIHARIKA SUSANI NEHA SANATHANA JAHNAVI	8.28

Class coordinator **HOD, EEE**

III B.Tech - I Sem (EEE)

SECTION	Courses	PSA	PE	MPMC	EHV	PS Lab	PE Lab	MPMC Lab	Cloud Computing (moocs)
	Course codes	GR20A3012	GR20A3012	GR20A3012	GR20A3012	GR20A3012	GR20A3012	GR20A3012	GR20A3012
A	TOTAL	65	65	65	65	65	65	65	
	PASS	50	50	47	60	63	64	64	
	PASS(%)	76.92%	76.92%	72.30%	92.30%	96.92%	98.46%	98.46%	
	FACULTY NAME	Dr J Sridevi	Dr Pakkiraiah B	Dr D Raveendra	Dr D G Padhan	Dr J Sridevi / V Usha Rani/ U Vijaya Lakshmi	Dr Pakkiraiah B/ G Sandhya Rani	Dr P Srividya Devi/ M N Sandhya Rani	P Ravikanth
	FACULTY ID	516	1593	1604	1283	516/1045/692	1593/888	931/882	1178

Class coordinator **Dr B. Phaneendra Babu**

HOD, EEE

GOKARAJU RANGARAJU INSTITUTE OF ENGNEERING AND TECHNOLOGGY
Approved By AICTE, Affiliated to JNTUH, Autonomous Under UGC
Nizampet Road, Bachupally, Kukatpally, Hyderabad - 500090, Telangana, India
Tel: 7207344440, Email:info@griet.ac.in, www.griet.ac.in

STUDENT FEEDBACK

Faculty : BHUPANAPATI. PAKKIRAIAH
Subject : Power Electronics Lab (B.Tech, III/IV B.Tech I Semester, EEE Sec-A)
Academic Year : 2022 - 2023
Phase : Phase-2

Sl.No	Question	Excellent	Good	Average	Poor	Q.Wise Total	Q.Wise %
1	Preparation and delivery of the lessons by the teacher	16	23	8	3	152	76.00
2	Subject Knowledge	15	27	5	3	154	77.00
3	Clarity in Communication	15	27	5	3	154	77.00
4	Using Modern Teaching Aids of ICT	14	28	5	3	153	76.00
5	Creating interest on the course in the class	16	22	9	3	151	76.00
6	Maintaining discipline in the class	16	24	7	3	153	76.00
7	Encouraging and clearing doubts in the class	17	23	6	4	153	76.00
8	Punctuality	17	23	7	3	154	77.00
9	Accessibility of the teacher	16	23	8	3	152	76.00
10	Overall grading of the teacher	17	22	8	3	153	76.00
	Total	159	242	68	31		
	Total Points	**636**	**726**	**136**	**31**	**1529**	**76.00**

No.Of Students Posted	50
Total Percentage Awarded to The Faculty	76.00
Grade of Faculty	Good

*Excellent (4) : >=90 % *Good (3) : >=75 & <90%
*Average (2) : >=60 & <75 % *Poor (1) : Below 60 %

Formula: Total Obtained Points/(Max Points(i.Excellent-4) * No.Of.Students * NoOfQuestions)

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Direct Internal CO Attainments

Academic Year	2022-23		Department	EEE						Name of the Programme	B. TECH									
Year - Semester	III-I		Course Name :	POWER ELECTRONICS LAB						Course Code	GR20A3021						Section	A		
	Lab Internal Examination																Record		Assessment	
	Q.No 1	Q.No 2	Q.No 3	Q.No 4	Q.No 5	Q.No 6	Q.No 7	Q.No 8	Q.No 9	Q.No 10	Q.No 11	Q.No 12	Q.No 13	Q.No 14	Q.No 15	Viva	Iteration 1	Iteration 2	Marks	
Enter CO Number → 1,2,3,4,5,6,7	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	1,2,3,4,5	1,2,3	4,5	1,2,3,4,5	
Marks →	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5	5	5	10	
S.No/Roll No.	Note : Enter Marks Between Two Green rows. Another Note : Additional Columns if Required should be inserted after column H and appropriately rename the Q. Nos.																			
1	6															3	3	4	6	
2		7														3	4	3	7	
3			10													5	5	5	10	
4				10												5	5	5	10	
5					9											5	5	5	9	
6						7										3	5	5	6	
7							8									5	5	5	10	
8								9								5	4	5	10	
9									10							5	5	5	9	
10										9						5	5	4	8	
11											9					5	5	5	10	
12												10				5	5	5	7	
13													10			5	3	5	10	
14														10		5	5	5	9	
15															10	5	5	3	10	
16	9															5	5	5	8	
17		10														5	5	5	10	
18			10													5	4	5	7	
19				10												5	5	5	7	
20					9											5	3	4	10	
21						9										5	5	5	6	
22							9									5	5	5	6	
23								9								5	5	3	10	
24									8							5	5	5	7	
25										10						5	3	3	7	
26											9					5	5	5	10	
27												10				5	3	5	10	
28													9			5	5	5	6	
29														8		5	5	5	10	
30															10	5	5	5	6	
31	9															5	5	5	10	
32		10														5	4	5	6	
33			8													5	5	5	10	
34				9												5	5	5	8	
35					8											5	3	3	10	
36						10										5	5	5	8	
37							9									5	5	5	10	
38								9								5	5	5	9	
39									9							5	5	5	10	
40										9						5	3	5	9	
41											9					5	5	5	9	
42												9				5	5	5	8	

43													10			5		5	3	10
44														10		5		5	5	8
45															10	5		3	5	10
46	10															5		5	5	7
47		10														5		5	3	10
48			6													5		5	5	9
49				9												5		5	5	10
50					10											5		4	5	6
51						9										5		5	3	10
52							8									5		5	5	8
53								9								5		5	5	10
54									10							5		5	5	8
55										6						5		5	3	10
56											9					5		3	5	7
57												10				5		3	5	10
58													9			5		5	4	6
59														8		5		5	5	10
60															7	5		5	5	7
61	10															5		4	3	10
62		10														5		5	5	8
63			10													5		5	5	10
64				9												5		3	4	10

if your class strength is > 60 then *insert rows* *above the green row Last record* , Similarly *delete the* *empty rows above green row* if the class strenght is < 60)

Total number of students appeared for the examination (NST)	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	64		64	64	64
Total number of students attempted the question (NSA)	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	64		64	64	64
Attempt % (TAP) = (NSA/NST)*100	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		100.00	100.00	100.00
Total number of Students who got more than 60% marks (NSM)	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	64		64	64	64
Attainment % (TMP) = (NSM/NSA)*100	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		100.00	100.00	100.00
Score(S)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		3	3	3

Note : CO attainment is considered to be zero if the attempt % is less than 30%

CO Validation	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**1,2,3,4,5**		**1,2,3**	**4,5**	**1,2,3,4,5**
Course Outcome	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**O1,CO2,CO3,CO4,CO**		**CO1,CO2, CO3**	**CO4,CO5**	**CO1,CO2,CO3, CO4,CO5**
Marks (Y)	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**5**		**5**	**5**	**10**
No. of COs Shared (Z)	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**5**		**3**	**2**	**5**
Y/Z	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**1**		**1.66667**	**2.5**	**2**
S*Y/Z	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**3**		**5**	**7.5**	**6**

CO1	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**		**1**	**0**	**1**
CO2	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**		**1**	**0**	**1**
CO3	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**		**1**	**0**	**1**
CO4	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**		**0**	**1**	**1**
CO5	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**		**0**	**1**	**1**
CO6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**
CO7	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**

Weighted Average for Attainment relevance (Internal CODn)	CO1	CO2	CO3	CO4	CO5	CO6	CO7
	3.00	3.00	3.00	3.00	3.00		

!! Caution !! For CO Values < 2.1 should be justified with Remidial Action Report.

Gokaraju Rangaraju Institute of Engineering and Technology

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Indirect CO Attainments

Academic Year	2022-23	Department	EEE	Name of the Programme	B. TECH		
Year - Semester	III-I	Course Name :	POWER ELECTRONICS LAB	Course Code	GR20A3021	Section	A

Course Outcomes survey on Scale 1 (Low) to 5 (High)

Course Outcome→	Choose appropriate switching devices & firing circuits based on their characteristics and application	Design and analyze the operation of power switching converters	Develop practical control circuits for various real time applications	Analyze and evaluate the operation of Inverters & Cycloconverters	Judge power electronic converter performance for various applications in virtual platforms		
CO Number 1,2,3,4,5,6,7	1	2	3	4	5		
Marks	5	5	5	5	5		
S.No/Roll No.	Note : Enter Marks Between Two Green rows.						
1	5	5	4	3	5		
2	5	4	3	5	5		
3	4	3	5	5	5		
4	5	5	5	4	3		
5	5	5	4	3	5		
6	4	3	5	5	5		
7	5	4	3	5	5		
8	5	5	4	3	5		
9	3	5	5	5	4		
10	5	4	3	5	5		
11	5	5	5	4	3		
12	4	3	5	5	5		
13	5	4	3	5	5		
14	5	5	4	3	5		
15	5	5	5	4	3		
16	5	5	5	3	4		
17	5	5	3	4	5		
18	5	3	4	5	5		
19	3	4	5	5	5		
20	4	3	5	5	5		
21	5	4	3	5	5		
22	5	5	4	3	5		
23	5	5	5	3	4		
24	5	5	3	4	5		
25	5	3	4	5	5		
26	3	4	5	5	5		
27	4	3	5	5	5		
28	5	4	3	5	5		
29	5	5	4	3	5		
30	5	5	5	4	3		
31	5	5	5	3	4		
32	5	5	3	4	5		
33	5	3	4	5	5		
34	3	4	5	5	5		
35	4	3	5	5	5		
36	5	4	3	5	5		
37	5	5	4	3	5		
38	5	5	5	4	3		
39	5	5	5	3	4		
40	5	5	3	4	5		
41	5	3	4	5	5		
42	3	4	5	5	5		
43	4	3	5	5	5		
44	5	4	3	5	5		
45	5	5	4	3	5		
46	5	5	5	4	3		
47	5	5	5	3	4		
48	5	3	4	5	5		
49	3	4	5	5	5		
50	4	3	5	5	5		
51	5	4	3	5	5		
52	5	5	4	3	5		
53	5	5	5	4	3		
54	5	5	5	3	4		
55	5	5	3	4	5		
56	5	3	4	5	5		
57	3	4	5	5	5		
58	4	3	5	5	5		
59	3	4	3	5	5		
60	5	3	4	3	5		
61	5	5	3	4	3		
62	5	5	3	3	4		
63	5	5	3	4	5		
64	5	3	4	5	5		
65	3	4	5	5	5		
66	5	5	4	3	5		
67	5	4	3	5	5		
68	4	3	5	5	5		
69	5	3	3	4	3		
70	5	5	4	3	5		
71	4	3	5	5	5		
72	3	4	3	5	5		
73	5	5	4	3	5		
74	3	5	5	5	4		
75	5	4	3	5	5		
76	5	5	5	4	3		
77	4	3	5	5	5		
78	5	4	3	5	5		
79	5	5	4	3	5		
80	3	5	5	4	3		
81	5	5	5	3	4		
82	5	5	3	4	5		
83	5	3	4	5	5		
84	3	4	5	5	5		
85	4	3	5	5	5		
86	5	4	3	5	5		
87	5	5	4	3	5		
88	5	5	5	3	4		
89	5	5	3	4	5		
90	5	3	4	5	5		
91	3	4	5	5	5		
92	4	3	5	5	5		
93	5	4	3	5	5		
94	5	5	4	3	5		
95	5	5	5	4	3		
96	5	5	5	3	4		
97	5	5	3	4	5		
98	5	3	4	5	5		
99	3	4	5	5	5		
100	4	3	5	5	5		
101	5	4	3	5	5		
102	5	5	4	3	5		
103	5	5	5	4	3		
104	5	5	5	3	4		
105	5	5	3	4	5		
106	5	3	4	5	5		
107	3	4	5	5	5		
108	4	3	5	5	5		
109	5	4	3	5	5		
110	5	5	4	3	5		
111	5	5	5	4	3		
112	5	5	5	3	4		
113	5	3	4	5	5		
114	3	4	5	5	5		
115	4	3	5	5	5		
116	5	4	3	5	5		
117	5	5	4	3	5		
118	3	3	3	4	3		
119	5	5	5	3	4		
120	5	5	3	4	5		
121	5	3	4	5	5		
122	3	4	5	5	5		
123	4	3	5	5	5		
124	5	4	3	5	5		
125	4	5	4	3	5		
126	5	4	4	4	3		

127	4	4	5	3	4		
128	4	5	3	4	5		
129	5	3	4	5	5		
130	3	4	4	5	5		
131	4	3	5	5	5		
If your class strength is > 60 then *insert rows above the green row Last record* , Similarly *delete the empty rows above green row* If the class strenght is < 60)							
Total number of students appeared for the examination (NST)	131	131	131	131	131		
Total number of students attempted the question (NSA)	131	131	131	131	131		
Attempt % (TAP) = (NSA/NST)*100	100.00	100.00	100.00	100.00	100.00		
Total number of Students who got more than 60% marks (NSM)	131	131	131	131	131		
Attainment % (TMP) = (NSM/NSA)*100	100.00	100.00	100.00	100.00	100.00		
Score(S)	3	3	3	3	3		

CO attainment is considered zero if the attempt % is less than 30%

Indirect CO (COIin)	CO1	CO2	CO3	CO4	CO5	CO6	CO7
	3	3	3	3	3		

!! Caution !! For CO Values < 2.1 should be justified with Remidial Action Report.

Gokaraju Rangaraju Institute of Engineering and Technology

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Direct External CO Attainment

Academic Year	2022-23		Department		EEE					Name of the Programme		B. TECH				
Year - Semester	III-I		Course Name :		POWER ELECTRONICS LAB					Course Code		GR20A3021			Section	A
	Part A										Part B					
	Q.No 1	Q.No 2	Q.No 3	Q.No 4	Q.No 5	Q.No 6	Q.No 7	Q.No 8	Q.No 9	Q.No 10	Q.No 11	Q.No 12	Q.No 13	Q.No 14	Q.No 15	Viva
Enter CO Number → 1,2,3,4,5,6,7	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	1,2,3,4,5
Marks →	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	20
S.No/Roll No.	***Note :*** Enter Marks Between Two Green rows. ***Another Note :*** Additional Columns if Required should be inserted after column H and appropriately rename the Q. Nos.															
1	20															14
2		38														16
3			39													20
4				38												18
5					50											10
6						41										19
7							39									20
8								37								20
9									37							20
10										44						17
11											39					20
12												38				20
13													44			18
14														36		20
15															38	19
16														43		19
17													40			20
18												38				19
19											36					20
20										35						19
21									40							20
22								38								19
23							39									18
24						38										18
25					40											20
26				40												17
27			39													19
28		41														17
29	39															17
30		46														20
31			39													19
32				45												20
33					38											18
34						43										18
35							40									18
36								38								17
37									44							17
38										33						20
39											37					20
40												40				19
41													30			20
42														39		20
43															38	20
44														37		20
45													35			20
46												41				20
47											35					20
48										40						18
49									39							20
50								37								20
51							39									20
52						36										20
53					42											18
54				43												17
55			35													20
56		37														20
57	39															20
58		43														18
59			31													14
60				38												20
61					44											18
62						40										20
63							44									20
64								43								20
if your class strength is > 60 then ***insert*** ***rows above the green row Last record*** , Similarly ***delete the empty rows above green row*** if the class strenght is < 60)																
Total number of students appeared for the examination (NST)	3	5	5	5	5	5	5	5	4	4	4	4	4	4	2	64
Total number of students attempted the question (NSA)	3	5	5	5	5	5	5	5	4	4	4	4	4	4	2	64
Attempt % (TAP) = (NSA/NST)*100	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total number of Students who got more than 60% marks (NSM)	2	5	5	5	5	5	5	5	4	4	4	4	4	4	2	63
Attainment % (TMP) = (NSM/NSA)*100	66.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.44
Score(S)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO attainment is considered zero if the attempt % is less than 30%																
CO Validation	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**1,2,3,4,5**
Course Outcome	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**COCO1**	**COCO2**	**COCO3**	**COCO4**	**COCO5**	**CO1,CO2,CO3,CO4,CO5**
Marks (Y)	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**20**
No. of COs Shared (Z)	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**5**
Y/Z	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**4**
S*Y/Z	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**12**
CO1	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
CO2	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
CO3	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**
CO4	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**
CO5	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
CO6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CO7	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Weighted Average for Attainment relevance (Internal CODn)	CO1	CO2	CO3	CO4	CO5	CO6	CO7
	3.00	3.00	3.00	3.00	3.00		

!! Caution !! For CO Values < 2.1 should be justified with Remidial Action Report.

Gokaraju Rangaraju Institute of Engineering and Technology
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Bachupally, Kukatpally, Hyderabad – 500 090

Summary Sheet CO Attainments

Academic Year:	2022-23
Course/Subject:	POWER ELECTRONICS LAB
Department:	EEE
Section	A

Name of the Program:	B. TECH
Course Code:	GR20A3021
Year - Semester :	III-I

Attainment/CO	CO1	CO2	CO3	CO4	CO5	CO6	CO7
Attainment for Direct Internal CO (Mid I & II, Assignments, Tutorials, Assessments, etc.)	3.00	3.00	3.00	3.00	3.00		
Attainment for Direct External CO (End Semester Exam)	3.00	3.00	3.00	3.00	3.00		
Direct CO (0.3*Internal + 0.7*External)	3.00	3.00	3.00	3.00	3.00		
Indirect CO	3.00	3.00	3.00	3.00	3.00		
Final CO (COFn) = (0.9 x Direct CO + 0.1 x Indirect CO)	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**		

CO	Course Outcome	Remedial Action for COs Less than 70% (2.10)
CO1	Choose appropriate switching devices & firing circuits based on their characteristics and application	NA
CO2	Design and analyze the operation of power switching converters	NA
CO3	Develop practical control circuits for various real time applications	NA
CO4	Analyze and evaluate the operation of Inverters & Cyclo converters	NA
CO5	Judge power electronic converter performance for various applications in virtual platforms and AC	NA

ID No.	Name of the Faculty	Department	Signature
1593	Dr PAKKIRAIAH B	EEE	

HOD **DAA**

Copy to: IQAC

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Bachupally, Kukatpally, Hyderabad – 500 090

Direct Internal CO Attainments

Academic Year	2022-23	**Department**	EEE	**Name of the Programme**	B. TECH
Year - Semester	III-I	**Course Name :**	POWER ELECTRONICS LAB	**Course Code**	GR20A3021

P-Outcomes / C-Outcomes	A	B	C	D	E	F	G	H	I	J	K	L	PSO1	PSO2
1	M				M	H	M	H	M	M	H	H	M	
2	M	M	M	M	M		H		H	M	H	H	M	H
3	H	H		H	M		M	M	H	H	H	H	M	H
4		M	M				M	H	M		H	H	M	
5			H		M		M	M	M	H	H	H	M	H

Enter H,M, L values of CO-PO Mapping Matrix in blue shaded rows 12 - 18 for seven CO s automatically PO Attainments are Calculated

←

Convert above mappings to scale 1-3

P-Outcomes / C-Outcomes	A	B	C	D	E	F	G	H	I	J	K	L	PSO1	PSO2
CO1	2				2	3	2	3	2	2	3	3	2	
CO2	2	2	2	2	2		3		3	2	3	3	2	3
CO3	3	3		3	2		2	2	3	3	3	3	2	3
CO4		2	2				2	3	2		3	3	2	
CO5			3		2		2	2	2	3	3	3	2	3
Expected Attainment	2.33	2.33	2.33	2.50	2.00	3.00	2.20	2.50	2.40	2.50	3.00	3.00	2.00	3.00

	CO1	CO2	CO3	CO4	CO5		
Final Cos CoF	3.00	3.00	3.00	3.00	3.00		

	Attained PO A	Attained PO B	Attained PO C	Attained PO D	Attained PO E	Attained PO F	Attained PO G	Attained PO H	Attained PO I	Attained PO J	Attained PO K	Attained PO L	PSO1	PSO2
CO1	2.00				2.00	3.00	2.00	3.00	2.00	2.00	3.00	3.00	2.00	
CO2	2.00	2.00	2.00	2.00	2.00		3.00		3.00	2.00	3.00	3.00	2.00	3.00
CO3	3.00	3.00		3.00	2.00		2.00	2.00	3.00	3.00	3.00	3.00	2.00	3.00
CO4		2.00	2.00				2.00	3.00	2.00		3.00	3.00	2.00	
CO5			3.00		2.00		2.00	2.00	2.00	3.00	3.00	3.00	2.00	3.00

CO6														
CO7														
Attained	2.33	2.33	2.33	2.50	2.00	3.00	2.20	2.50	2.40	2.50	3.00	3.00	2.00	3.00

	A	B	C	D	E	F	G	H	I	J	K	L	PSO1	PSO2
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		
Expected	2.33	2.33	2.33	2.50	2.00	3.00	2.20	2.50	2.40	2.50	3.00	3.00	2.00	3.00
Attained	2.33	2.33	2.33	2.50	2.00	3.00	2.20	2.50	2.40	2.50	3.00	3.00	2.00	3.00
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note : PO is Satisfied if attained PO > 70, U indicates PO Unsatisfied

Faculty Co-Ordinator **HOD**