VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
Estd. u/s 3 of UGC Act 1956

Department of Electrical and Electronics Engineering

Date: 19.06.2022

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B.Tech., Electrical and Electronics Engineering programme was conducted on 17.06.2022 in virtual mode from 10.00am to 1.00pm.

All the internal members of VFSTR attended the meeting in person while all the external members participated the meeting virtually with link:

https://us02web.zoom.us/j/6400485257?pwd=jN9EMqLRUorw6gcZ3T5gmA-QP1BvNQ

Agenda of the BoS Meeting:

1. To discuss and finalize the curriculum structure and detailed syllabus of B.Tech., EEE Programme for the regulation 2022.
2. To approve theR22 curriculum and syllabus of B.Tech., EEE Programme and recommend to the Academic council.
3. Any other points with the permission of Chairperson.

The following members were present either thorough offline or online.

Sl.	Name of the Faculty	Designation	Position
1	Dr. G. Srinivasa Rao	Professor & Head, Dept. of EEE, VFSTR	Chairperson
2	Dr. K. Mercy Rosalina	Professor, Dept. of EEE, VFSTR	Member & Dean R&D nominee
3	Dr. Polamraju V.S. Sobhan	Associate Professor, Dept. of EEE, VFSTR	Member & Secretary
4	Dr. M. Subba Rao	Associate Professor, Dept. of EEE, VFSTR	Member
5	Dr. K. Balakrishna	Assistant Professor, Dept. of EEE, VFSTR	Member
6	Dr. A.R. Vijay Babu	Assistant Professor, Dept. of EEE, VFSTR	Member
7	Dr. K. Siva Kumar	Professor, Dept. of EEE, IIT, Hyderabad	Member
8	Dr. Nagesh Vangala	CTO, M/s Chirra Engineers Pvt. Ltd, Bangalore	Member
10	Dr. B. Satish Babu	Sr. Staff Engineer, Infineon Technologies, Bangalore	Special Invitee

The following members have taken leave of absence:

Sl.	Name of the Faculty	Designation	Position
1	Dr M.Sarada	Professor, Department of ECE, VFSTR University	Invited Member & School Dean Nominee
2	Dr. Mannam V. Rayudu	CEO, M/s Chirra Engineers Pvt. Ltd, Bangalore	Special Invitee

In the beginning of the meeting the Chairperson of the BoS, Dr. G. Srinivasa Rao, Professor and Head, department of EEE welcomed all the members and briefed them about the progress of the Department.

Chairperson presented about the *NEP 2020 Compliant Regulation - R22* which emphasis on creating learning centric (continuous learning and continuous assessment model), offering B.Tech., B.Tech. with Honours/ Research Honours/ Minor/ Add-on Diploma, , providing multiple entry and multiple exits.

The BoS members expressed their highly appreciation and satisfaction about

- Revision in tune with National Education Policy 2020
- Various exit options
- Regular Degree along with Minor Degree
- the reduction in total credits
- Module wise course syllabus

The following points were discussed in the BoS meeting:

1. Regulation R22.
2. Curriculum structure with credits, credits distribution.
3. 2 Modules instead of 5 units.
4. Assessment methods (Formative & Summative).
5. Electives and streams/pools.
6. Minor / Honor courses.

The following are the views expressed by the external members

Dr. K. Siva Kumar

- Appreciated introduction of Basics of Electrical & Electronics Engineering course for all branches of engineering
- Suggested to introduce Practical component for the courses 1. Electrical Circuits and Networks 2. Digital Electronic Circuits
- Advised to offer the courses having fundamental concepts of emerging courses as Department Elective – 1 and 2. If any specialized basket for Department Electives should start from Department Elective – 3
- Proposed to include the concept of Triggering and commutation of IGBT in the Course Power Switching Devices & Converters.

Dr. Nagesh Vangala

- Appreciated introduction branch specific module in the course Basic Engineering Products and IT workshop as one module
- Proposed to include "Electronic Principles" by Albert Malvino and David J. Bates as a reference book in the Basics of Electrical & Electronics Engineering course.
- Suggested to introduce case studies related to electrical engineering in the Introduction to Soft Computing course.
- Advised to include practical components in some of the department electives by increasing the credits from 3 to 4

Dr. B. Satish Babu

- Appreciated the concepts – semiconductor physics, electrostatics and optoelectronics in the Engineering Physics course.
- Suggested to include Special Machines as a Department Elective
- Suggested to increase the number of Department Elective courses in the areas – solar and wind energy systems, Battery management systems.

All the external BoS members appreciated

- Revision in tune with National Education Policy 2020
- Various exit options (Certificate, Advanced Diploma, Diploma, & BTech)
- Regular Degree along with Minor Degree
- the reduction in total credits,
- Module wise course syllabus

The following resolutions made after the discussion:

1. BoS Members approved the revised regulations, curriculum structure, syllabus of B.Tech.,EEE programme and it follows based on the NEP 2020. Curriculum structure is provided in Appendix-A.
2. Major restructuring has taken place in the curriculum which is oriented towards continuous learning and assessment based on Module structure.
3. Major reformation has taken place in the curriculum by offering Honors/Specialization degree or Minor degree thorough 20 more credits with additional courses.
4. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development, provided in Appendix- B.
5. The significant changes are made in the content of all courses and hence the courses are considered as new courses provided in Appendix- C.
6. Stakeholders feedback is analyzed thoroughly and the curriculum follows the choice based credit system (CBCS).
7. All the students of R21 regulation is migrated to R22 curriculum from 2nd year 1st semester onwards. To maintain the balance between total credits and courses for award of degree we have make changes in the following courses
    - Electrical Circuit Analysis (4 Credits) may be replaced with DC Machines and Transformers (4 Credits) in 2(1) of R22.
    - DC Machines and Transformers (4 Credits) has to be offered in "Summer Semester".
8. Total average percentage of syllabus revised was **56%** compared to previous curriculum

Based on the suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately in the curriculum and syllabi of the regulation R22 and this will be recommended to the Academic Council of VFSTR for the approval.

There being no further points for discussion, the Chairpersonthanks all the external, internal, invited members and announced that the meeting was adjourned.

Member Secretary

Chairperson

The following are the members present for the board of studies meeting held at Department of Electrical and Electronics Engineering on 17.06.2022

Sl. No.	Name of the Member	Designation	Signature
External Members:			
1.	Dr. K. Siva Kumar	Professor, Dept. of EEE, IIT, Hyderabad	Participated the meeting virtually
2.	Dr. Nagesh Vangala	CTO, M/s Chirra Engineers Pvt. Ltd, Bangalore	
3	Dr. B. Satish Babu	Sr. Staff Engineer, Infineon Technologies, Bangalore	
Internal Members:			
1.	Dr. G. Srinivasa Rao	Professor & Head, Dept. of EEE, VFSTR	
2.	Dr. K. Mercy Rosalina	Professor, Dept. of EEE, VFSTR	
3	Dr. Polamraju V.S. Sobhan	Associate Professor, Dept. of EEE, VFSTR	
4.	Dr. M. Subba Rao	Associate Professor, Dept. of EEE, VFSTR	
5.	Dr. K. Balakrishna	Assistant Professor, Dept. of EEE, VFSTR	
6	Dr. A.R. Vijay Babu	Assistant Professor, Dept. of EEE, VFSTR	

VIGNAN FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH
VADLAMUDI

Course structure for R22

Department of Electrical & Electronics Engineering

I Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks
1.	Mathematics – I	3	-	2	4	Basic Sciences
2.	Physics	2	-	2	3	Basic Sciences
3.	Basics of Electrical & Electronics Engineering	2	-	2	3	Basic Engineering
4.	Basic Electrical Engineering Products	-	-	6	3	Basic Engineering
5.	Programming in C	2	-	4	4	Basic Engineering
6.	English Proficiency & Communication Skills (PET)	-	-	2	1	Humanities
7.	Physical Fitness, Sports & Games – I	-	-	3	1	Binary grade
8.	Constitution of India	-	1	-	1	Binary grade
	Total	9	1	21	20	
		31 hr				

VIGNAN FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH
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Course structure for R22

Department of Electrical & Electronics Engineering

I Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks
1.	Mathematics – I	3	-	2	4	Basic Sciences
2.	Physics	2	-	2	3	Basic Sciences
3.	Basics of Electrical & Electronics Engineering	2	-	2	3	Basic Engineering
4.	Basic Electrical Engineering Products	-	-	6	3	Basic Engineering
5.	Programming in C	2	-	4	4	Basic Engineering
6.	English Proficiency & Communication Skills (PET)	-	-	2	1	Humanities
7.	Physical Fitness, Sports & Games – I	-	-	3	1	Binary grade
8.	Constitution of India	-	1	-	1	Binary grade
	Total	9	1	21	20	
		31 hr				

Unit-II **4 Weeks**

FUNDAMENTALS OF AC CIRCUITS:

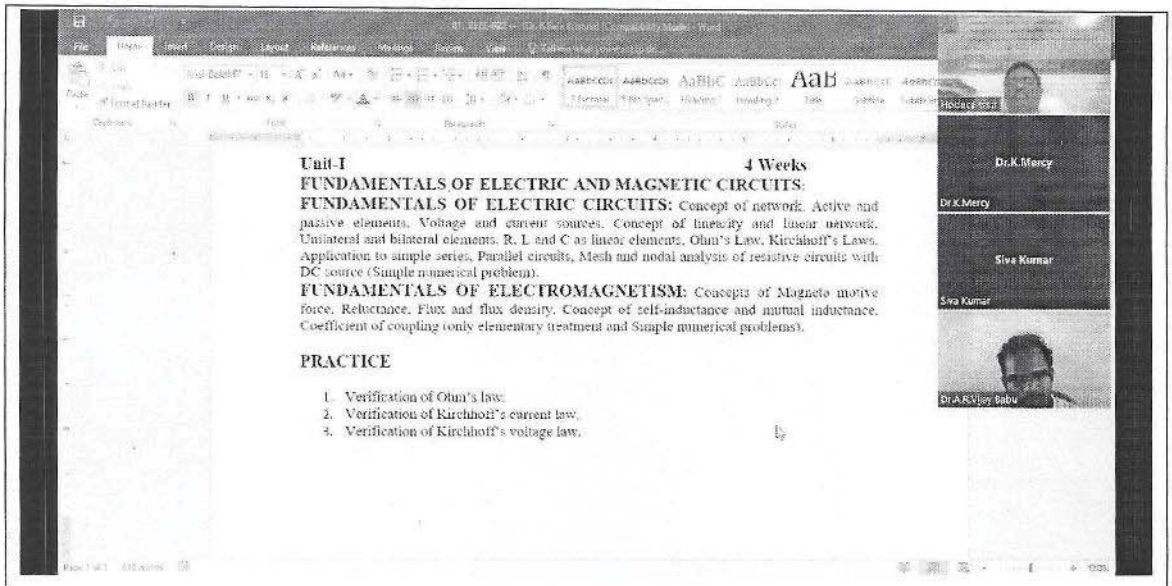
SINGLE PHASE SYSTEM: Generation of AC voltage, Frequency, Average value, R.M.S. value, Form factor, Peak factor for sinusoidal only; Analysis of single- phase ac circuits consisting of R, L, C, RL, RC (series and parallel) (simple numerical problems).

BALANCED THREE PHASE SYSTEMS: Introduction to three phase system. Relation between phase and line quantities of voltages and currents in star and delta connected systems (Elementary treatment only).

PRACTICE

1. Determination of R.M.S. Values of sinusoidal waveform.
2. Determination of impedance in complex AC circuits.
3. Verification of line and phase quantities in a balanced three phase system

Module –II



Unit-I **4 Weeks**

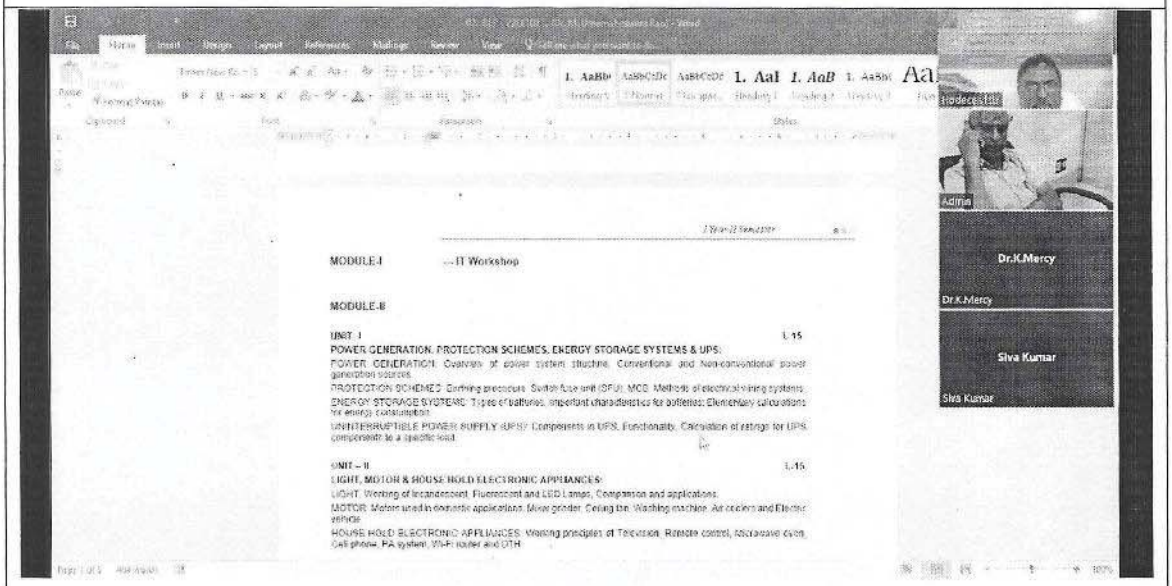
FUNDAMENTALS OF ELECTRIC AND MAGNETIC CIRCUITS:

FUNDAMENTALS OF ELECTRIC CIRCUITS: Concept of network. Active and passive elements. Voltage and current sources. Concept of linearity and linear network. Unilateral and bilateral elements. R, L and C as linear elements. Ohm's Law. Kirchhoff's Laws. Application to simple series, Parallel circuits, Mesh and nodal analysis of resistive circuits with DC source (Simple numerical problem).

FUNDAMENTALS OF ELECTROMAGNETISM: Concepts of Magneto motive force, Reluctance, Flux and flux density. Concept of self-inductance and mutual inductance. Coefficient of coupling (only elementary treatment and Simple numerical problems).

PRACTICE

1. Verification of Ohm's law.
2. Verification of Kirchhoff's current law.
3. Verification of Kirchhoff's voltage law.



MODULE-I — IT Workshop

MODULE-II

UNIT - I — L-15

POWER GENERATION, PROTECTION SCHEMES, ENERGY STORAGE SYSTEMS & UPS:

POWER GENERATION: Overview of power system structure. Conventional and Non-conventional power generation sources.

PROTECTION SCHEMES: Earthing procedure. Switch fuse unit (SFU), MCB. Methods of electrical wiring systems.

ENERGY STORAGE SYSTEMS: Types of batteries, important characteristics for batteries. Elementary calculations for energy consumption.

UNINTERRUPTIBLE POWER SUPPLY (UPS): Components in UPS. Functionality. Calculation of ratings for UPS components for a specific load.

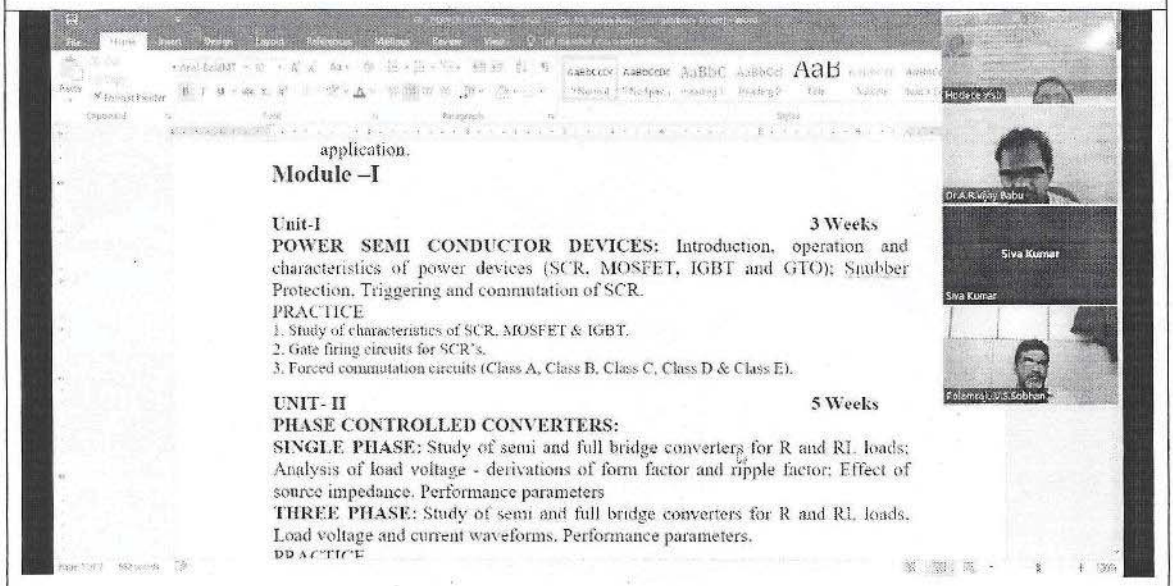
UNIT – II — L-15

LIGHT, MOTOR & HOUSE HOLD ELECTRONIC APPLIANCES:

LIGHT: Working of Incandescent, Fluorescent and LED Lamps, Comparison and applications.

MOTOR: Motors used in domestic applications. Mixie grinder, Ceiling fan, Washing machine, Air coolers and Electric vehicle.

HOUSE HOLD ELECTRONIC APPLIANCES: Working principles of Television, Remote control, Microwave oven, Cell phone, PA system, Wi-Fi router and OTH.



application.

Module –I

Unit-I **3 Weeks**

POWER SEMI CONDUCTOR DEVICES: Introduction, operation and characteristics of power devices (SCR, MOSFET, IGBT and GTO); Snubber Protection, Triggering and commutation of SCR.

PRACTICE

1. Study of characteristics of SCR, MOSFET & IGBT.
2. Gate firing circuits for SCR's.
3. Forced commutation circuits (Class A, Class B, Class C, Class D & Class E).

UNIT- II **5 Weeks**

PHASE CONTROLLED CONVERTERS:

SINGLE PHASE: Study of semi and full bridge converters for R and RL loads; Analysis of load voltage - derivations of form factor and ripple factor; Effect of source impedance. Performance parameters

THREE PHASE: Study of semi and full bridge converters for R and RL loads. Load voltage and current waveforms. Performance parameters.

PRACTICE

Department of Electrical and Electronics Engineering

APPENDIX - A
B.Tech EEE Programme: Curriculum Structure

I Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Linear Algebra	3	2	-	4	Basic Sciences	Mathematics
2	Semiconductor Physics and Electromagnetics	2	-	2	3	Basic Sciences	Physics
3	Basics of Electrical & Electronics Engineering	2	-	2	3	Basic Engineering	EEE
4	IT Workshop and Electrical Engineering Products	1	-	4	3	Basic Engineering	EEE
5	Programming in C	2	-	4	4	Basic Engineering	T&P
6	English Proficiency and Communication Skills	-	-	2	1	Humanities	English
7	Physical Fitness, Sports & Games-I	-	-	3	1	Binary grade	Physical Education
8	Constitution of India	-	2	-	1	Binary grade	T&P
	TOTAL	**10**	**4**	**17**	**20**		
		31 Hrs					

I Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Multivariate Calculus	3	2	0	4	Basic Sciences	Mathematics
2	Engineering Chemistry	2	-	2	3	Basic science	Chemistry
3	Engineering Graphics	2	-	2	3	Basic Engineering	Mechanical
4	Basic Coding Competency	-	2	2	2	Basic Engineering	T&P
5	Technical English Communication	2	-	2	3	Humanities	English
6	Electrical Circuits and Networks	3	2	-	4	Professional core	EEE
7	Physical Fitness, Sports & Games – II	-	-	3	1	Binary grade	Physical Education
8	**Orientation Session**	-	-	6	**3**	Binary grade	
	TOTAL	**12**	**6**	**17**	**23**		
		35 Hrs					

II Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Probability Theory and Statistics for Machine Learning	3	2	0	4	Basic Sciences	EEE
2	Environmental Studies	1	-	-	1	Basic Sciences	Chemistry
3	Data Structures	2	2	2	4	Basic Engineering	T&P
4	Power Transmission and Distribution	2	2	-	3	Professional core	EEE
5	DC Machines and Transformers	3		2	4	Professional core	EEE
6	Analog Electronics	3		2	4	Professional core	EEE
7	Digital Electronic Circuits	2	2	-	3	Professional core	EEE
8	Life Skills	-	-	2	1	Binary grade	
	TOTAL	**16**	**8**	**8**	**24**		
	NCC / NSS / SAC / E-cell / Student Mentoring/ Social activities/ Publication with good impact factor				**1**	Floating credits Binary grade	
	TOTAL	**16**	**8**	**8**	**25**		
		32 Hrs					

II Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Advanced Coding Competency	-	-	2	1	Basic Engineering	T&P
2	Professional Communication	-	-	2	1	Humanities	T&P
3	Induction and Synchronous Machines	3		2	4	Professional core	EEE
4	Power Electronic Devices And Circuits	3		2	4	Professional core	EEE
5	Management Science	2	2	-	3	Humanities	Management Studies
6	Department Elective – 1	3			3	Department Elective	EEE
7	Open Elective – 1	3			3	Open Elective	
8	Life Skills	-	-	2	1	Binary grade	
	TOTAL	**14**	**2**	**10**	**20**		
	Minor / Honors – 1	3		2	**4**		
	TOTAL	17	2	12	**24**		
		31 Hrs					

III Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Soft Skills Lab	-	-	2	1	Humanities	T&P
2	Linear Control Systems	3	-	2	4	Professional core	EEE
3	Electrical Measurements & Instrumentation	3		2	4	Professional core	EEE
4	Analysis and Operation of Power Systems	3		2	4	Professional core	EEE
5	Department Elective – 2	3			3	Department Elective	EEE
6	Open Elective – 2	3			3	Open Elective	
7	Industry interface course (Modular course)	1			1	Binary Grades	
8	Inter-Departmental Project / Course	-	-	2	-	Project	
	TOTAL	16	-	10	**20**		
	NCC / NSS / SAC / E-cell / Student Mentoring/ Social activities/ Publication with good impact factor				**1**	Floating credits Binary grade	
	Minor / Honors – 2	3	-	2	**4**		
	TOTAL	19	-	12	**25**		
		31 Hrs					

III Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Quantitative aptitude & Logical Reasoning	1	2	-	2	Humanities	T&P
2	Microprocessors & Microcontrollers	3		2	4	Professional core	EEE
3	Digital Signal Processing	2	2		3	Professional core	EEE
4	Department Elective – 3	3			3	Department Elective	EEE
5	Department Elective – 4	3			3	Department Elective	EEE
6	Open Elective – 3	3			3	Open Elective	
7	Inter-Departmental Project/Course	-	-	2	2	Project	
	TOTAL	**15**	**4**	**4**	**20**		
	Minor / Honors – 3	3	-	2	**4**		
	TOTAL	**18**	**4**	**6**	**24**		
		28 Hrs					

IV Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Power System Protection	3		2	4	Professional core	EEE
2	Industrial Electric Drives	3		2	4	Professional core	EEE
3	Department Elective – 5	3		2	4	Department Elective	EEE
4	Department Elective – 6	3		2	4	Department Elective	EEE
5	Department Elective – 7	3	2	-	4	Department Elective	EEE
	TOTAL	**15**	**2**	**8**	**20**		
	Minor / Honors – 4	3	-	2	**4**		
	TOTAL	**18**	**2**	**10**	**24**		
		30 Hrs					

IV Year II Semester

Sl.No.	Course Title	L	T	P	C	Remarks	Offered Dept.
1	Internship / Project Work		2#	22	12	Project	EEE
	TOTAL				**12**		
	Minor / Honors – 5 (for project)		2	6	**4**	**Theory course may be also offered**	
	TOTAL		4#	28	**16**		

DEPARTMENT ELECTIVES

Sl. No.	Course Title	L	T	P	C	Offered Dept.
1	Green Energy Technologies	2	2	-	3	EEE
2	Electric Vehicles	2	2	-	3	EEE
3	High Voltage Engineering	2	2	-	3	EEE
4	Switch Mode Power Conversion	3	-	2	4	EEE
5	Sensors and Transducers	3	-	2	4	EEE
6	Special Electrical Machines	3	-	2	4	EEE
7	Optimization Techniques	3	-	2	4	EEE
8	Advanced Control Systems	3	-	2	4	EEE
9	Energy System Economics	3	2	-	4	EEE
10	Power Quality	2	2	2	4	EEE
11	Advanced Power System Analysis	3	-	2	4	EEE
12	Energy Storage Technologies	2	2	-	3	EEE
13	Energy Audit, Conservation and Management	2	2	-	3	EEE
14	Smart Grid Technologies	2	2	-	3	EEE
15	Advanced Power Electronics	2	2	-	3	EEE
16	Flexible of AC Transmission Systems	2	2	-	3	EEE
17	SCADA Systems and Applications	2	2	-	3	EEE
18	Plug-In Electric Vehicles in Smart Grid	2	2	-	3	EEE
19	Soft Computing Techniques in Electrical Engineering	2	2	-	3	EEE
20	Programmable Logic Controllers	2	2	-	3	EEE
21	PV Technologies and Applications	2	2	-	3	EEE
22	Utilization of Electrical Energy	2	2	-	3	EEE

HONORS - ELECTRIC VEHICLES

Sl. No.	Course Title	L	T	P	C	Offered Dept.
1	Electric Vehicles Technology	3	2	-	4	EEE
2	Energy Storage System and Management System	3	2	-	4	EEE
3	EV Charging Infrastructure	3	2	-	4	EEE
4	Modelling and Simulation of Electric Vehicles	3	2	-	4	EEE
5	Intelligent Transport Systems	3	2	-	4	EEE
	TOTAL	**15**	**10**	**-**	**20**	

OPEN ELECTIVES

Sl. No.	Course Title	L	T	P	C	Offered Dept.
1	Fundamentals of Solar Cells	2	2	-	3	EEE
2	Solar Photovoltaic Systems	2	2	-	3	EEE
3	Design and Economics of PV Systems	2	2	-	3	EEE
4	Solar Thermal Energy Conversion Systems	2	2	-	3	EEE
5	Fundamentals of Electric Vehicles	2	2	-	3	EEE
	TOTAL	**10**	**10**	**-**	**15**	

MINOR-01 - E-MOBILITY

Sl. No.	Course Title	L	T	P	C	Offered Dept.
1	Power Electronics for E-Mobility	3	-	2	4	**EEE**
2	Electric Motors & Control	3	-	2	4	**EEE**
3	Electric Vehicles Technology	3	2	-	4	**EEE**
4	Energy Storage System and Management System	3	2	-	4	**EEE**
5	EV Charging Infrastructure	3	2	-	4	**EEE**
	TOTAL	**15**	**6**	**4**	**20**	

MINOR-02 - ALTERNATE ENERGY TECHNOLOGIES

Sl. No.	Course Title	L	T	P	C	Offered Dept.
1	Principles of Solar Energy	3	2	-	4	EEE
2	Fundamentals of Solar PV Systems	3	2	-	4	EEE
3	New & Renewable Energy Technologies	3	2	-	4	EEE
4	Energy System Economics	3	2	-	4	EEE
5	Principles of Energy Management and Audit	3	2	-	4	EEE
	TOTAL	**15**	**10**	**-**	**20**	

Chairperson

Department of Electrical and Electronics Engineering

APPENDIX - B

List of Courses that Enables Employability or Entrepreneurship or Skill Development

S. No.	Year and Semester	Course Title	Employability / Entrepreneurship / Skill development
1	I Year I Semester	Linear Algebra	Skill development
2	I Year I Semester	Semiconductor Physics and Electromagnetics	Skill development
3	I Year I Semester	Basics of Electrical & Electronics Engineering	Skill development
4	I Year I Semester	IT Workshop and Electrical Engineering Products	Skill development
5	I Year I Semester	Programming in C	Employability
6	I Year I Semester	English Proficiency and Communication Skills	Skill development
7	I Year I Semester	Physical Fitness, Sports & Games-I	Skill development
8	I Year I Semester	Constitution of India	Employability
9	I Year II Semester	Multivariate Calculus	Skill development
10	I Year II Semester	Engineering Chemistry	Skill development
11	I Year II Semester	Engineering Graphics	Employability
12	I Year II Semester	Basic Coding Competency	Employability
13	I Year II Semester	Technical English Communication	Skill development
14	I Year II Semester	Electrical Circuit and Networks	Skill development
15	I Year II Semester	Physical Fitness, Sports & Games – II	Skill development
16	I Year II Semester	Orientation Session	Skill development
17	II Year I Semester	Probability Theory and Statistics for Machine Learning	Skill development
18	II Year I Semester	Environmental Studies	Skill development
19	II Year I Semester	Data Structures	Employability
20	II Year I Semester	Power Transmission and Distribution	Skill development
21	II Year I Semester	DC Machines and Transformers	Skill development
22	II Year I Semester	Analog Electronics	Skill development
23	II Year I Semester	Digital Electronic Circuits	Skill development
24	II Year I Semester	Life Skills	Skill development
25	II Year II Semester	Advanced Coding Competency	Employability
26	II Year II Semester	Professional Communication	Employability
27	II Year II Semester	Induction and Synchronous Machines	Skill development
28	II Year II Semester	Power Electronic Devices And Circuits	Skill development
29	II Year II Semester	Management Science	Entrepreneurship
30	II Year II Semester	Life Skills	Skill development
31	III Year I Semester	Soft Skills Lab	Skill development
32	III Year I Semester	Linear Control Systems	Skill development
33	III Year I Semester	Electrical Measurements & Instrumentation	Skill development
34	III Year I Semester	Analysis and Operation of Power Systems	Skill development
35	III Year I Semester	Industry interface course (Modular course)	Employability
36	III Year I Semester	Inter-Departmental Project / Course	Employability
37	III Year II Semester	Quantitative aptitude & Logical Reasoning	Employability
38	III Year II Semester	Microprocessors & Microcontrollers	Skill development
39	III Year II Semester	Digital Signal Processing	Employability
40	III Year II Semester	Inter-Departmental Project/Course	Employability
41	IV Year I Semester	Power System Protection	Skill development
42	IV Year I Semester	Industrial Electric Drives	Employability
43	IV Year II Semester	Internship / Project Work	Employability
44	Department Electives	Green Energy Technologies	Skill development
45	Department Electives	Electric Vehicles	Employability

46	Department Electives	High Voltage Engineering	**Skill development**
47	Department Electives	Switch Mode Power Conversion	**Employability**
48	Department Electives	Sensors and Transducers	**Skill development**
49	Department Electives	Special Electrical Machines	**Employability**
50	Department Electives	Optimization Techniques	**Skill development**
51	Department Electives	Advanced Control Systems	**Skill development**
52	Department Electives	Energy System Economics	**Employability**
53	Department Electives	Power Quality	**Skill development**
54	Department Electives	Advanced Power System Analysis	**Skill development**
55	Department Electives	Energy Storage Technologies	**Employability**
56	Department Electives	Energy Audit, Conservation and Management	**Employability**
57	Department Electives	Smart Grid Technologies	**Employability**
58	Department Electives	Advanced Power Electronics	**Employability**
59	Department Electives	Flexible of AC Transmission Systems	**Employability**
60	Department Electives	SCADA Systems and Applications	**Employability**
61	Department Electives	Plug-In Electric Vehicles in Smart Grid	**Employability**
62	Department Electives	Soft Computing Techniques in Electrical Engineering	**Employability**
63	Department Electives	Programmable Logic Controllers	**Employability**
64	Department Electives	PV Technologies and Applications	**Employability**
65	Department Electives	Utilization of Electrical Energy	**Skill development**
66	Open Electives	Fundamentals of Solar Cells	**Skill development**
67	Open Electives	Solar Photovoltaic Systems	**Skill development**
68	Open Electives	Design and Economics of PV Systems	**Employability**
69	Open Electives	Solar Thermal Energy Conversion Systems	**Employability**
70	Open Electives	Fundamentals of Electric Vehicles	**Skill development**
71	Honors – Electric Vehicels	Electric Vehicles Technology	**Employability**
72	Honors – Electric Vehicels	Energy Storage System and Management System	**Employability**
73	Honors – Electric Vehicels	EV Charging Infrastructure	**Employability**
74	Honors – Electric Vehicels	Modelling and Simulation of Electric Vehicles	**Employability**
75	Honors – Electric Vehicels	Intelligent Transport Systems	**Employability**
76	Minor – E-Mobility	Power Electronics for E-Mobility	**Employability**
77	Minor – E-Mobility	Electric Motors & Control	**Employability**
78	Minor – E-Mobility	Electric Vehicles Technology	**Employability**
79	Minor – E-Mobility	Energy Storage System and Management System	**Employability**
80	Minor – E-Mobility	EV Charging Infrastructure	**Employability**

81	Minor – Alternate Energy Technologies	Principles of Solar Energy	**Skill development**
82	Minor – Alternate Energy Technologies	Fundamentals of Solar PV Systems	**Skill development**
83	Minor – Alternate Energy Technologies	New & Renewable Energy Technologies	**Skill development**
84	Minor – Alternate Energy Technologies	Energy System Economics	**Employability**
85	Minor – Alternate Energy Technologies	Principles of Energy Management and Audit	**Employability**

Chairperson

Department of Electrical and Electronics Engineering

APPENDIX - C
List of New Courses in the R22 Curriculum

S. No.	Year and Semester	Course Title
1	I Year I Semester	Linear Algebra
2	I Year I Semester	Semiconductor Physics and Electromagnetics
3	I Year I Semester	Basics of Electrical & Electronics Engineering
4	I Year I Semester	IT Workshop and Electrical Engineering Products
5	I Year I Semester	Programming in C
6	I Year I Semester	English Proficiency and Communication Skills
7	I Year I Semester	Physical Fitness, Sports & Games-I
8	I Year I Semester	Constitution of India
9	I Year II Semester	Multivariate Calculus
10	I Year II Semester	Engineering Chemistry
11	I Year II Semester	Engineering Graphics
12	I Year II Semester	Coding Competency (Basic)
13	I Year II Semester	Technical English Communication
14	I Year II Semester	Electrical Circuit and Networks
15	I Year II Semester	Physical Fitness, Sports & Games – II
16	I Year II Semester	Orientation Session
17	II Year I Semester	Probability Theory and Statistics for Machine Learning
18	II Year I Semester	Environmental Studies
19	II Year I Semester	Data Structures
20	II Year I Semester	Power Transmission and Distribution
21	II Year I Semester	DC Machines and Transformers
22	II Year I Semester	Analog Electronics
23	II Year I Semester	Digital Electronic Circuits
24	II Year I Semester	Life Skills
25	II Year II Semester	Coding Competency (Advanced)
26	II Year II Semester	Professional Communication
27	II Year II Semester	Induction and Synchronous Machines
28	II Year II Semester	Power Electronic Devices And Circuits
29	II Year II Semester	Management Science
30	II Year II Semester	Life Skills
31	III Year I Semester	Soft Skills Lab
32	III Year I Semester	Linear Control Systems
33	III Year I Semester	Electrical Measurements & Instrumentation
34	III Year I Semester	Analysis and Operation of Power Systems
35	III Year I Semester	Industry interface course (Modular course)
36	III Year I Semester	Inter-Departmental Project / Course
37	III Year II Semester	Quantitative aptitude & Logical Reasoning
38	III Year II Semester	Microprocessors & Microcontrollers
39	III Year II Semester	Digital Signal Processing
40	III Year II Semester	Inter-Departmental Project/Course
41	IV Year I Semester	Power System Protection
42	IV Year I Semester	Industrial Electric Drives
43	IV Year II Semester	Internship / Project Work
44	Department Electives	Green Energy Technologies
45	Department Electives	Electric Vehicles
46	Department Electives	High Voltage Engineering
47	Department Electives	Switch Mode Power Conversion
48	Department Electives	Sensors and Transducers
49	Department Electives	Special Electrical Machines

50	Department Electives	Optimization Techniques
51	Department Electives	Advanced Control Systems
52	Department Electives	Energy System Economics
53	Department Electives	Power Quality
54	Department Electives	Advanced Power System Analysis
55	Department Electives	Energy Storage Technologies
56	Department Electives	Energy Audit, Conservation and Management
57	Department Electives	Smart Grid Technologies
58	Department Electives	Advanced Power Electronics
59	Department Electives	Flexible of AC Transmission Systems
60	Department Electives	SCADA Systems and Applications
61	Department Electives	Plug-In Electric Vehicles in Smart Grid
62	Department Electives	Soft Computing Techniques in Electrical Engineering
63	Department Electives	Programmable Logic Controllers
64	Department Electives	PV Technologies and Applications
65	Department Electives	Utilization of Electrical Energy
66	Open Electives	Fundamentals of Solar Cells
67	Open Electives	Solar Photovoltaic Systems
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