

Covering Letter

19-8-2025

From

Dr. A Pandian,

Professor and Head,

Department of Electrical & Electronics Engineering,

KLEF

To

The Principal,

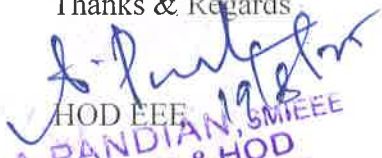
KL College of Engineering.

Respected Sir,

Sub: Submission of BOS Minutes August 2025

I here by attach the XXXVII Board of Studies Minutes of Department of Electrical & Electronics Engineering held on 13-8-2025 in Hybrid mode. All the changes are mentioned .Kindly consider sir.

Thanks & Regards


HOD EEE
Dr. A. PANDIAN, SMIEEE
Professor & HOD
Department of EEE
KLEF Deemed to be University
Green Fields, Vaddeswaram,
Guntur Dt., A.P., 522 302.


PRINCIPAL
College of Engineering
Koneru Lakshmaiah Education Foundation
(Deemed to be University)
Green Fields, VADDESWARAM-522 302
Guntur District, Andhra Pradesh.



Dt: 18-08-2025

Department of Electrical & Electronics Engineering

Minutes of the XXXVII BOS Meeting

The Department XXXVII BOS meeting is held on 13th AUGUST 2025 from 02.30PM onwards in HYBRID mode.

The following members were present:

1. Dr. A Pandian-Professor & HoD, Department of EEE, KLEF- Chairman
2. Dr. Dogga Raveendra, Assistant Professor, EED, MNNIT External Member
3. Er. Anmol Agarwaker, CEO, SkyLamps,-External Member
4. Dr. K Sarada, Associate Professor, Department of EEE, KLEF- Internal Member
5. Dr. R Bhanu Prakash, Associate Professor, Department of EEE, KLEF- Internal Member
6. Dr.J Somlal, Professor, Department of EEE, KLEF - Internal Member
7. Dr. B Loveswara Rao, Professor, Department of EEE, KLEF - Internal Member
8. Dr. P Srinivas Varma, Associate Professor, Department of EEE, KLEF- Internal Member
9. Dr. M Kiran Kumar, Associate Professor, Department of EEE, KLEF- Internal Member
10. Dr. B Jyothi, Associate Professor, Department of EEE, KLEF- Internal Member
11. Mr. D Seshi Reddy, Associate Professor, Department of EEE, KLEF- Internal Member
12. Dr. G Raja Sekhar, Associate Professor, Department of EEE, KLEF-Internal Member
13. Dr. D Sudha, Assistant professor, Department of EEE, KLEF-Internal member
14. Dr. G Swapna, Assistant professor, Department of EEE, KLEF-Internal member
15. Mr. T Teja Sreenu, Assistant Professor, Department of EEE, KLEF-Internal Member
16. Dr. D Kalyan, Assistant Professor, Department of EEE, KLEF-Internal Member
17. Dr. S Ravi Teja, Assistant Professor, Department of EEE KLEF- Internal Member
18. B DANIEL ZACHARIA (2401200010), PG-Student Representative-KLEF
19. B NAVEEN (2401200007), PG-Student Representative, KLEF
20. P AEKANTH (2200069004), 4th year-student representative, KLEF
21. SMD FAROOQ ALI (2200069025), 4th year-student representative, KLEF
22. B. JAYANTH (2200069065), 4th year-student representative, KLEF
23. P SANGEETHA(2200060025), 4th year-student representative, KLEF
24. SUMANTHIKA KANCHARLA (2300060008), 3rd year-student representative, KLEF
25. KASIREDDY VARSHINI (2300060019), 3rd year-student representative, KLEF

Members Absent: NIL

(Signature)
Dr.A. PANDIAN, SMIEEE
Professor & HOD
Department of EEE
KLEF Deemed to be University
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Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 - 3500122, 2576129

Agenda and Resolutions

AGENDA ITEM-1

Department Achievements for the A. Y.2024-2025	BoS appreciated the efforts of faculty and the university management for their achievements done by the students.
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The chairman presented the following achievements of students and faculty of the department during A.Y 2024-2025

Placements & Progression:

Placement statistics for the A.Y:2024-2025 were presented to all the members.

- Killi Murali Manoj – 31.0 LPA at Shikoku Kakoki Co. Ltd., Japan
- Surangula John Joshua – 28.61 LPA at ADTEC Plasma Technology Co., Japan
- Tadepalli Anand Kumar – 27.0 LPA at Hitachi Industrial, Japan
- Appana Naga Suresh – 12.0 LPA at Schneider Electric
- Tirumala Phanendra – 11.1 LPA at Thoughtworks
- Atul Jee – 9.0 LPA at TCS Prime
- Boreddy Sumalika – 8.05 LPA at Hyundai Motor India Ltd.

Highest Core Salary: 31 LPA | Top IT Package: 11.1 LPA

PATAN SALAR KHAN (2200069019) participated in MARUTI SUZUKI IIMC INNOVATION CHALLENGE held at IIM Calcutta.

M Harshitha (2401200003) II/II M.Tech (PEPS) students gained an internship at L&T, Chennai in the month June 2025.

Research & Development

Total no. of publications including Scopus and SCI indexed by the department are 476+169 with h-index-Scopue:27, web of science: 15.

13 scholars of the department were awarded with PhD degrees in the A.Y: 2024-2025 till date.

Department of EEE organized “5 Day FDP on Next Generation Electrical Engineering : Innovations in Smart Grids, Green Energy and EV Automation.”, sponsored by DST-ANRF (SERB), Government of India. from 23rd – 27th June 2025. Total 60 participants from various institutions have actively participated in the FDP.

AGENDA ITEM-2

To approve resolutions made in DAC meeting held on 07-08-2025	The resolutions are made in DAC are approved and recommended the same to the academic Council for further approval
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The internal and external BOS members approved the resolutions made in Department Academic Committee (DAC)



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The internal and external BOS members approved the resolutions made in Department Academic Committee (DAC)



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The DAC minutes in Annexure-1a

Stake holders feedback in Annexure 1-b

AGENDA ITEM-3

To consider and approve the modification in Syllabus B.Tech of Y24 and Y25 approved structures	It is resolved to Syllabus B.Tech of Y24 and Y25 approved structures. and to recommend for further approval in Academic Council..
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Following are the courses revised in Y24 admitted batch students

sl	Course Code	Course Name	Category	% revision
1	24EE2222F	INDUSTRIAL APPLICATION OF ELECTRICAL MACHINES	FCC	25%
2	24EE2205A	POWER ELECTRONICS	PCC	25%
3	24EE2206	POWER SYSTEM ANALYSIS AND STABILITY	PCC	2%
4	24EE2230F	CONTROL SYSTEMS	PCC	15%
5	24AAS3102	AI AND CONTROLS FOR AUTONOMOUS FUTURE TRANSPORT	PEC	10%
6	24AAS3309	AUTONOMOUS ELECTRIC MOBILITY - SYSTEMS AND APPLICATIONS	PEC	10%
7	24EME3101	POWER TRAIN DESIGN FOR ELECTRIC VEHICLE	PEC	10%
8	24EME3304	CHARGING STATIONS FOR ELECTRIC VEHICLES	PEC	10%
9	24GET3101	SOLAR PV AND MICRO ENERGY TECHNOLOGIES	PEC	10%
10	24GET3304	GRID INTEGRATION OF RENEWABLE ENERGY SOURCES	PEC	10%
11	24ILA3101	INTRODUCTION TO INDUSTRIAL INTERNET OF THINGS	PEC	10%
12	24ILA3304	INDUSTRIAL DRIVES AND CONTROL	PEC	10%
13	24SGT3101	DISTRIBUTED ENERGY RESOURCES AND SMART GRIDS	PEC	10%
14	24SGT3304	ENERGY MANAGEMENT SYSTEMS AND SCADA	PEC	10%
15	24SDEE01	VISUALIZATION AND MODELING OF CIRCUITS	SDC	25%
16	24SDEE05	MODELING AND SIMULATION OF GREEN ENERGY SYSTEMS	SDC	20%

Y25 Regulation

sl	Course Code	Course Name	Category	% revision
1	25EC1101	BASIC ELECTRICAL AND ELECTRONIC CIRCUITS	ESC	25%

All the internal and external members of BOS member verified the syllabus of approved Curriculum of Y25 B.Tech admitted Batch and also Y24 admitted batch (II YEAR-EVEN SEMESTER ONWARDS)

Anneure-2

AGENDA ITEM-4

To approve courses introduced for students admitted in B. Tech(EEE) in academic year 2025-	It is resolved to approve approve courses introduced for students admitted in B. Tech(EEE) in
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2026

academic year 2025-2026 and to recommend the same to Academic Council for further approval.

New Courses for Y25 admitted Students

sl	Course Code	Course Name	Category	Remarks
1	25UC0032	INSIGHTS TO SUSTAINABLE DEVELOPMENT GOALS	Audit	As per National Education Policy
2	25SC2007	PYTHON PROGRAMMING	ESC	As per the recommendations of CSE research group
3	25EC1102	DIGITAL SYSTEM DESIGN	ESC	As per the recommendations of ECE research group
4	25MT1002	DISCRETE MATHEMATICS	BSC	As per AICTE guidelines

External members Dr. D Ravindra, Associate Professor, EED, MNNIT and Er. Anmol Agarwal, CEO-Sky Lamps and internal BOS committee reviewed the proposed new courses for B.Tech admitted students in academic year 2025-2026 for the Electrical and Electronics Engineering Department.

Annexure-2a

AGENDA 5

To consider and approve the Structure and Syllabus of both programs M.TECH(PEPS) and M.TECH(EEE) Y25 admitted batch in EEE Department.	It is resolved to approve the Structure and Syllabus of M.TECH(PEPS) and M.TECH(EEE) for Y25 admitted batch and to recommend for further approval in Academic Council.
--	--

All the BOS members approved the structure and syllabus of Y25 admitted students in M.TECH(PEPS) and M.TECH(EEE) offered by EEE Department.

Annexure-3

AGENDA 6

To consider and approve the list of Pre-PhD courses of Y25 admitted batch in EEE Department.	It is resolved to approve the list of pre-phd courses for scholars admitted in Y25 batch and to recommend for further approval in Academic Council
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List of Pre-Phd courses is attached in Annexure 4

AGENDA 6

To discuss any other related points.

The Chairperson expressed gratitude to all members for their valuable contributions and active participation. The meeting concluded with an agreement on the next steps for implementing the approved items.

Bauer



Koneru Lakshmaiah Education Foundation

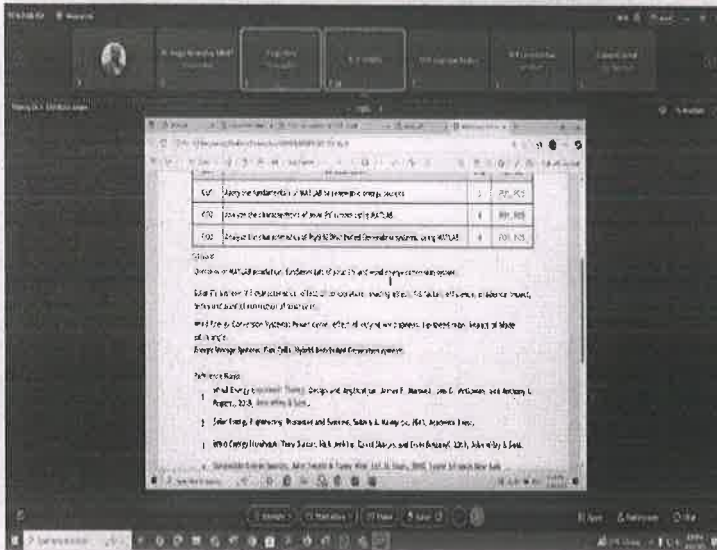
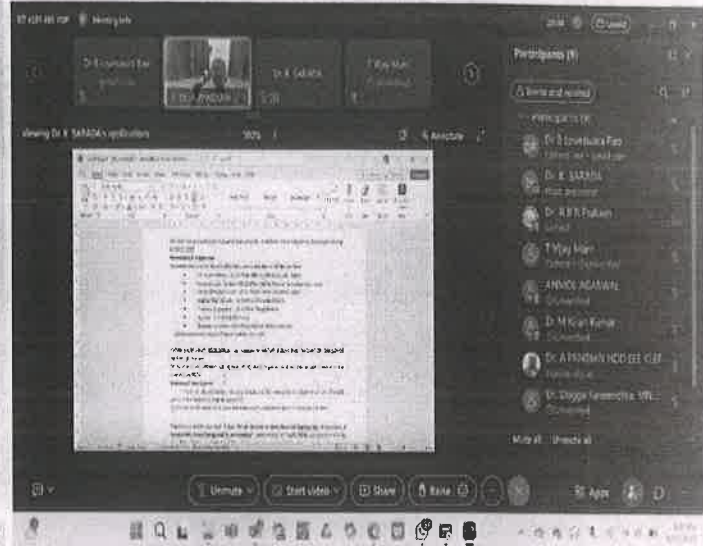
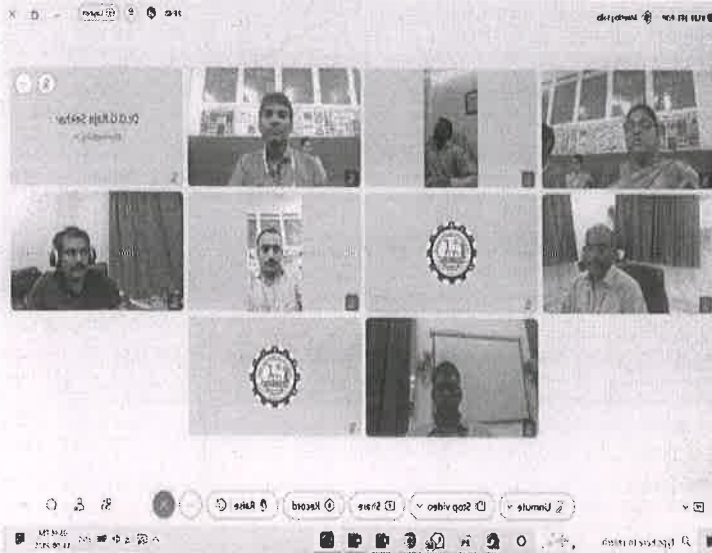
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Pictures of BOS meeting proceedings:



Bavy

A. Pandian
Dr. A. PANDIAN, SMIEEE
Professor & HOD
Department of EEE
KLEF Deemed to be University
Green Fields, Vaddeswaram,
Guntur Dt., A.P., 522 302.



Dt: 09-08-2025

Department of Electrical & Electronics Engineering

Minutes of the Department Academic Committee (DAC) Meeting

The Department DAC meeting is held on 07th August 2025 from 03.00PM onwards in C323 offline mode.

The following members were present:

18. Dr. A Pandian-Professor & HoD, Department of EEE, KLEF- Chairman
19. Dr.J Somlal, Professor, Department of EEE, KLEF - Internal Member
20. Dr. B Loveswara Rao, Professor, Department of EEE, KLEF - Internal Member
21. Dr. P Srinivas Varma, Associate Professor, Department of EEE, KLEF- Internal Member
22. Dr. M Kiran Kumar, Associate Professor, Department of EEE, KLEF- Internal Member
23. Dr. B Jyothi, Associate Professor, Department of EEE, KLEF- Internal Member
24. Mrs. K Sarada, Associate Professor, Department of EEE, KLEF- Internal Member
25. Mr. R Bhanu Prakash, Associate Professor, Department of EEE, KLEF- Internal Member
26. Mr. D Seshi Reddy, Associate Professor, Department of EEE, KLEF- Internal Member
27. Dr. G Raja Sekhar, Associate Professor, Department of EEE, KLEF-Internal Member
28. Dr. D Sudha, Assistant professor, Department of EEE, KLEF-Internal member
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31. Mr. D Kalyan, Assistant Professor, Department of EEE, KLEF-Internal Member
32. Mr. S Ravi Teja, Assistant Professor, Department of EEE KLEF- Internal Member
33. B DANIEL ZACHARIA (2401200010),PG-Student Representative, KLEF
34. B NAVEEN (2401200007) ,PG- Student Representative, KLEF.
35. P AEKANTH (2200069004), 4th YEAR- Student Representative, KLEF.
36. SMD FAROOQ ALI (2200069025), 4th Year-Student Representative, KLEF.
37. PAPANA SUMANTH, (2200069036), 4th YEAR- Student Representative, KLEF.
38. MUSHKE DEVENDAR (2200069040), 4th YEAR- Student Representative, KLEF.
39. B. JAYANTH (2200069065), 4th YEAR- Student Representative, KLEF.
40. P SANGEETHA (2200060025), 4th YEAR- Student Representative, KLEF.
41. SUMANTHIKA KANCHARLA (2300060008), 3rd YEAR- Student Representative, KLEF.
42. SHAIK MOHAMMAD SAIFULLAH (2300060015), 2ND YEAR- Student Representative, KLEF.
43. KASIREDDY VARSHINI (2300060019), 3rd YEAR- Student Representative, KLEF.
44. KATTA MEGHANA (2300060021), 3rd YEAR- Student Representative, KLEF.

Members Absent: NIL



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Agenda and Resolutions

AGENDA ITEM-1

Department Achievements for the A. Y.2024-2025	BoS appreciated the efforts of faculty and the university management for their achievements done by the students.
--	---

The meeting commenced with the Chairperson presenting the minutes of the last Department Advisory Committee (DAC) meeting for review and approval. The DAC minutes included laboratory development, industry collaborations, and faculty development programs.

The chairman presented the following achievements of students and faculty of the department during A.Y 2024-2025

Placements & Progression:

Placement statistics for the A.Y:2024-2025 were presented to all the members.

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AGENDA ITEM-2

Discussed Feedback received from Various Stake Holders	Resolution are taken as per the feedback and recommend for further approval in Board of studies.
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Feedback Analysis is attached as Annexure-1



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AGENDA ITEM-3

To consider and approve the Syllabus B.Tech of Y24 and Y25 approved structures	It is resolved to Syllabus B.Tech of Y24 and Y25 approved structures. and to recommend for further approval in Board of studies.
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All the member verified the syllabus of approved Curriculum of Y25 B.Tech admitted Batch and also Y24 admitted batch (II YEAR-EVEN SEMESTER ONWARDS) Anneure-2

All members expressed their satisfaction

AGENDA ITEM-4

To consider and approve revision of syllabus and courses introduced in Y24 and Y25 B.Tech admitted students offered by Electrical and Electronics Engineering Department.	It is resolved to approve and approve revision of syllabus and courses introduced in Y24 and Y25 B.tech admitted students offered by Electrical and Electronics Engineering Department.and to recommend the same to Board of studies for further approval.
---	--

Following are the courses revised in Y24 admitted batch students

sl	Course Code	Course Name	Category	% revision
1	24EE2222F	INDUSTRIAL APPLICATION OF ELECTRICAL MACHINES	FCC	25%
2	24EE2205A	POWER ELECTRONICS	PCC	25%
3	24EE2206	POWER SYSTEM ANALYSIS AND STABILITY	PCC	2%
4	24EE2230F	CONTROL SYSTEMS	PCC	15%
5	24AAS3102	AI AND CONTROLS FOR AUTONOMOUS FUTURE TRANSPORT	PEC	10%
6	24AAS3309	AUTONOMOUS ELECTRIC MOBILITY - SYSTEMS AND APPLICATIONS	PEC	10%
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Y25 Regulation

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3	25EC1102	DIGITAL SYSTEM DESIGN	ESC	As per the recommendations of ECE research group
4	25MT1002	DISCRETE MATHEMATICS	BSC	As per AICTE guidelines

Annexure-3

AGENDA 5

To consider and approve the Structure and Syllabus of both programs M.TECH(PEPS) and M.TECH(EEE) Y25 admitted batch in EEE Department.	It is resolved to approve the Structure and Syllabus of M.TECH(PEPS) and M.TECH(EEE) for Y25 admitted batch and to recommend for further approval in Board of studies.
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All the DAC members approved the structure and syllabus of Y25 admitted students in M.TECH(PEPS) and M.TECH(EEE) offered by EEE Department.

Annexure-4

AGENDA 6

To consider and approve the list of Pre-PhD courses of Y25 admitted batch in EEE Department.	It is resolved to approve the list of pre-phd courses for scholars admitted in Y25 batch and to recommend for further approval in Board of studies.
--	---

List of Pre-Phd courses is attached in Annexure

Annexure-5

AGENDA 6

To discuss any other related points.

The meeting concluded with appreciation for the efforts of faculty members .

The chairperson thanked all members for their valuable contributions.

Pictures of DAC meeting proceedings:



Signature

Dr. A. PANDIAN, SMIEE
Professor & HOD
Department of EEE
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Department of Electrical & Electronics Engineering

Stake Holders Feedback, A.Y: 2025-2026

SL	Stake Holder	Recommendations	Resolutions
1	Industry	Dr. BALAKRISHNA P suggested to include "application case studies" for every core subject (e.g., transformers in renewable integration, drives in EV propulsion).	It is our regular practice to include Case Studies wherever required.
2	Industry	ER. SATISHBABU BHOGINENI recommended to integrate Cybersecurity for Electrical Infrastructure — increasingly critical in smart grids.	Separate courses on Cybersecurity for Electrical Infrastructure is offered in each specialization.
3	Industry	Dr.RAJENDRAN RAMASAMY Suggested to include application-based converter design concepts.	It is resolved to include application-based converter design concepts in the course Power Electronics course for Advance Learners.
4	Academic Peers	DR. ASHA RANI M A recommended to introduce AI/ML in Electrical Systems and IoT in Power Systems to prepare students for Industry 4.0.	AI/ML in Electrical Systems and IoT in Power Systems related courses were offered in specialization-based courses.
5	Academic Peers	DR. SURESH KUMAR GADI suggested to include concepts on Digital protection	In Power System Protection and Control , Digital Protection concepts were included for Advance learners
6	Alumni	Mr. SIVA PRASAD KATURU recommended to add PLC in core courses	It is resolved to consider including PLC in the course Control Systems
7	Alumni	Mr. Varun suggested to include PLC course in the curriculum	As per the industry needs it is offered as Advance courses to students.
8	Faculty	Dr. T Vijay Muni suggested to Include Hybrid Distributed Generation systems in MODELING AND SIMULATION OF GREEN ENERGY SYSTEMS as it is the specialization-based Skill Development Course.	It is resolved to include the topics related Hybrid Distributed Generation systems in MODELING AND SIMULATION OF GREEN ENERGY SYSTEMS
9	Faculty	Power Electronics research group members recommended to include Special Purpose Motors in Industrial Applications of Electrical Machines	It is resolved to add the concepts related to Special Purpose Motors in Industrial Applications of Electrical Machines
10	Students	Sunadh(2300060017) and 2300060027 requested to offer specialization in Ai through Computational Intelligence.	Students in University are encouraged to do multi-disciplinary courses Via specialization. students were recommended
11	Students	Y22 students requested to provide Core training for placements	In view of placements, it is resolved to provide Core training from the starting of semester along with coding.



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12	Parents	S N V Srinivasa Rao was happy with the balanced curriculum designed for the benefit of students.	-
13	Parents	B Prashanthi expressed that every lab course should have both hands-on experiments and simulation experiments to bridge theory and practice.	Courses related to Lab/Skill has both hardware and software experiments.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Y25 REGULATION B.TECH EEE

SL	CAT	CODE	COURSE TITLE	SHORT NAME	L	T	P	S	Cr	CH	PRE REQUISITE
1	AUC	25UC0008	INDIAN CONSTITUTION	IC	2	0	0	0	0	2	NIL
2	AUC	25UC0009	ECOLOGY AND ENVIRONMENT	E&E	2	0	0	0	0	2	NIL
3	AUC	25UC0017	INDIAN ANCIENT KNOWLEDGE SYSTEMS : VEDIC MATHEMATICS	IAKS-VM	2	0	0	0	0	2	NIL
4	AUC	25UC0032	INSIGHTS TO SUSTAINABLE DEVELOPMENT GOALS	SDG	2	0	0	0	0	2	NIL
No. of Courses and Credits					11	0	0	0	0	8.00	
5	BRIDGE	25UC0018	FUNDAMENTALS OF MATHEMATICS (BIPC)	FOM	3	0	0	0	0	3	NIL
	BRIDGE		FUNDAMENTALS OF BIOLOGY	FOB	3	0	0	0	0	3	NIL
No. of Courses and Credits					6	0	0	0	0		
6	HAS	25UC1102	LANGUAGE SKILLS FOR ENGINEERS	LSE	0	0	4	0	2	4	NIL
7	HAS	25UC1204	COMMUNICATION SKILLS FOR ENGINEERS	CSE	0	0	4	0	2	4	NIL
8	HAS	25UC1203	DESIGN THINKING FOR INNOVATION	DTI	0	0	4	0	2	4	NIL
9	HAS	25FLXXXX	FOREIGN LANGUAGE ELECTIVE	FLE	3	0	0	0	3	3	NIL
10	HAS	25UC0026	HUMAN VALUES , GENDER EQUALITY AND PROFESSIONAL ETHICS	HGP	2	0	0	0	2	2	NIL
11	HAS	25MBXXXX	MANAGEMENT ELECTIVE	MGE	3	0	0	0	3	3	NIL
12	HAS	25UC0021	SOCIAL IMMERSIVE LEARNING-1	SIL-1	0	0	2	0	1	2	NIL
13	HAS	25UC0022	SOCIAL IMMERSIVE LEARNING-2	SIL-2	0	0	2	0	1	2	NIL
No. of Courses and Credits					0	0	4	0	16	24.00	
14	BSC	25MT1002	DISCRETE MATHEMATICS	DMS	2	2	0	0	4	4	NIL
15	BSC	25MT1001	LINEAR ALGEBRA AND CALCULUS FOR ENGINEERS	LCE	2	2	0	0	4	4	NIL
16	BSC	25MT2008	COMPLEX ANALYSIS AND TRANSFORM TECHNIQUES	CATT	2	2	0	0	4	4	NIL
17	BSC	25EE2103	ELECTRO MAGNETIC FIELDS & ENGINEERING MATERIALS	EMFEM	3	1	0	0	4	4	NIL
18	BSC	25CY1001	ENGINEERING CHEMISTRY	ECY	3	0	2	0	4	5	NIL
No. of Courses and Credits					12	7	2	0	20	21.00	
19	ESC	25SC1101	PROBLEM SOLVING TECHNIQUES THROUGH C	PST-C	3	0	2	4	5	9	NIL
20	ESC	25SC2007	PYTHON PROGRAMMING	PP	2	0	2	0	3	4	PST-C
21	ESC	25SC1203	DATA STRUCTURES	DST	3	0	2	4	5	9	PST-C
22	ESC	25ME1103	DESIGN TOOLS WORKSHOP	DTW	0	0	4	0	2	4	DTI
23	ESC	25EC1102	DIGITAL SYSTEM DESIGN	DSD	3	0	2	0	4	5	NIL
24	ESC	25EC1101	BASIC ELECTRICAL AND ELECTRONIC CIRCUITS	BEEC	3	0	2	0	4	5	NIL



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25	ESC	25EC1203	FUNDAMENTALS OF IOT AND SENSORS	FIS	2	0	2	0	3	4	NIL
26	ESC	25SC2007	OBJECT ORIENTED PROGRAMMING	OOP	3	0	2	2	4.5	7	NIL
No.of Courses and Credits					19	0	18	10	30.5	47.00	
27	PCC	25EC1204	COMPUTER ORGANIZATION AND ARCHITECTURE	COA	3	0	0	0	3	3	NIL
28	PCC	25AD2002	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	AIML	3	0	2	0	4	5	NIL
29	PCC	25EC2104	ANALOG ELECTRONIC CIRCUIT DESIGN	AECD	3	0	2	2	4.5	7	NIL
30	PCC	25EC2106	PROCESSORS AND CONTROLLERS	PAC	3	0	2	0	4	5	NIL
31	PCC	25EE2101	ELECTRICAL CIRCUITS	ELC	3	0	2	0	4	5	BEEC
32	PCC	25EE2102	ELECTRICAL MACHINES	ELM	3	0	2	0	4	5	BEEC
33	PCC	25EE2204	ELECTRICAL POWER GENERATION , TRANSMISSION AND DISTRIBUTION	EPGTD	3	1	0	0	4	4	BEEC
34	PCC	25EE2205	POWER ELECTRONICS	PET	3	0	2	0	4	5	ELC
35	PCC	25EE3106	POWER SYSTEM ANALYSIS AND STABILITY	PSAS	3	1	0	0	4	4	EPGTD
36	PCC	25EE3208	POWER SYSTEM PROTECTION AND CONTROL	PSPC	3	0	2	2	4.5	7	EPGTD
37	PCC	25EE3207	AI TECHNIQUES FOR ELECTRICAL ENGINEERING	AITEE	3	0	2	0	4	5	EPGTD
No.of Courses and Credits					30	2	16	4	44	55.00	
38	FCC	25EE222F	INDUSTRIAL APPLICATIONS OF ELECTRICAL MACHINES	IAEM	2	0	2	0	3	4	ELM
39	FCC	25EE2231F	CONTROL SYSTEMS	CSE	2	0	2	0	3	4	NIL
No.of Courses and Credits					4	0	4	0	6	8.00	62
40	PEC	PEC-1	PROFESSIONAL ELECTIVE-1	PEC-1	3	0	2	0	4	5	RELEVANT COURSE
41	PEC	PEC-2	PROFESSIONAL ELECTIVE-2	PEC-2	3	0	0	0	3	3	RELEVANT COURSE
42	PEC	PEC-3	PROFESSIONAL ELECTIVE-3	PEC-3	3	0	0	2	3.5	5	RELEVANT COURSE
43	PEC	PEC-4	PROFESSIONAL ELECTIVE-4	PEC-4	3	0	0	0	3	3	RELEVANT COURSE
44	PEC	PEC-5	PROFESSIONAL ELECTIVE-5	PEC-5	3	0	0	0	3	3	RELEVANT COURSE
No.of Courses and Credits					15	0	2	2	16.5	19.00	
45	SDC	25SDEE01	VISUALIZATION AND MODELING OF CIRCUITS	VMC	1	0	0	4	2	3	NIL
46	SDC	25SDEE02	EMBEDDED SYSTEM DESIGN WITH ARM	ESDA	1	0	0	4	2	3	NIL
47	SDC	25SDEE03	IOT INTERFACE DESIGN	IID	1	0	0	4	2	3	NIL
48	SDC	25SDEE04	SKILL DEVELOPMENT PROJECT-4 (SPECIALIZATION)	SDC-4	1	0	0	4	2	3	NIL
No.of Courses and Credits					4	0	0	16	8	12.00	



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49	PRI	25IE2040	SOCIAL INTERNSHIP	SIP	0	0	0	4	0	0	NIL
50	PRI	25IE3041	TECHNICAL INTERNSHIP	TIP	0	0	0	4	0	0	NIL
51	PRI	25IE4053	ENGINEERING CAPSTONE PROJECT-1	ECP-1	0	0	8	16	8	8	RELEVANT COURSE
52	PRI	25IE4054	ENGINEERING CAPSTONE PROJECT-2	ECP-2	0	0	8	16	8	8	RELEVANT COURSE
No.of Courses and Credits					0	0	16	40	16	16.00	
53	OEC	OEC-1	OPEN ELECTIVE-1	OEC-1	3	0	0	0	3	3	NIL
54	OEC	OEC-2	OPEN ELECTIVE-2	OEC-2	3	0	0	0	3	3	NIL
55	OEC	OEC-3	OPEN ELECTIVE-3	OEC-3	3	0	0	0	3	3	NIL
No.of Courses and Credits					9	0	0	0	9	9.00	
56	VAC	VAC-1	VALUE ADDED COURSE-1	VAC-1	0	0	0	2	0	2	NIL
57	VAC	VAC-2	VALUE ADDED COURSE-2	VAC-2	0	0	0	2	0	2	NIL
58	VAC	VAC-3	VALUE ADDED COURSE-3	VAC-3	0	0	0	2	0	2	NIL
59	VAC	VAC-4	SPORTS/YOGA CERTIFICATION	VAC-4	0	0	0	2	0	2	NIL
No.of Courses and Credits					0	0	0	8	0	8	
TOTAL CREDITS									166.00	227.00	

PROFESSIONAL ELECTIVES

CAT	Course Code	Course Title	L	T	P	S	Cr	CH	PRE-REQUISITE	Specialization
PEC-1	25AAS3102	AI AND CONTROLS FOR AUTONOMOUS FUTURE TRANSPORT	3	0	2	0	4	5	ELM/ EAS/PC	AI & AUTONOMOUS SYSTEMS
PEC-2	25AAS3205	AUTONOMOUS VEHICLE ECU DESIGN WITH AUTOSAR	3	0	0	0	3	3	ELM/ EAS/PC	
PEC-3	25AAS3309	AUTONOMOUS ELECTRIC MOBILITY - SYSTEMS AND APPLICATIONS	3	0	0	2	3.5	5	ELM/ EAS/PC	
PEC-4	25AAS3410	CYBERSECURITY IN AUTONOMOUS VEHICLE	3	0	0	0	3	3	ELM/ EAS/PC	
PEC-5	25AAS3511	AI DRIVEN ECU DESIGN FOR AUTONOMOUS VEHICLES	3	0	0	0	3	3	ELM/ EAS/PC	
PEC-1	25EME3101	POWER TRAIN DESIGN FOR ELECTRIC VEHICLE	3	0	2	0	4	5	ELM OR ET	E-MOBILITY ENGINEERING
PEC-2	25EME3202	COMMUNICATION PROTOCOLS & TESTING OF ELECTRIC VEHICLE	3	0	0	0	3	3	ELM OR ET	
PEC-2	25EME32XX	AUTONOMOUS VEHICLES & AUTOMOTIVE ELECTRONICS	3	0	0	0	3	3	ELM OR ET	
PEC-3	25EME3304	CHARGING STATIONS FOR ELECTRIC VEHICLES	3	0	0	2	3.5	5	ELM OR ET	
PEC-4	25EME3406	BATTERY STATE ESTIMATION ALGORITHMS FOR ELECTRIC VEHICLE	3	0	0	0	3	3	ELM OR ET	
PEC-5	25EME3507	AI AND IOT FOR ELECTRIC VEHICLE	3	0	0	0	3	3	ELM OR	



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									ET	
PEC-5	25EME3508	EV SYSTEM AND WIRING DESIGN	3	0	0	0	3	3	ELM OR ET	GREEN ENERGY TECHNOLOGIES
PEC-1	25GET3101	SOLAR PV AND MICRO ENERGY TECHNOLOGIES	3	0	2	0	4	5	EPGTD OR EPE	
PEC-2	25GET3202	WIND AND ENERGY STORAGE TECHNOLOGIES	3	0	0	0	3	3	EPGTD OR EPE	
PEC-2	25GET3203	ENERGY ECONOMICS AND POLICY	3	0	0	0	3	3	EPGTD OR EPE	
PEC-3	25GET3304	GRID INTEGRATION OF RENEWABLE ENERGY SOURCES	3	0	0	2	3.5	5	EPGTD OR EPE	
PEC-4	25GET3405	ENERGY MANAGEMENT AND GREEN BUILDINGS	3	0	0	0	3	3	EPGTD OR EPE	
PEC-4	25GET3406	HYDROGEN FUEL CELL TECHNOLOGY	3	0	0	0	3	3	EPGTD OR EPE	
PEC-5	25GET3507	AI AND IOT FOR GREEN ENERGY INTEGRATION	3	0	0	0	3	3	EPGTD OR EPE	
PEC-5	25GET3508	POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS	3	0	0	0	3	3	ELM OR ET	
PEC-1	25ILA3101	INTRODUCTION TO INDUSTRIAL INTERNET OF THINGS	3	0	2	0	4	5	ELM OR ET	INDUSTRIAL AUTOMATION
PEC-2	25ILA3202	INDUSTRIAL AUTOMATION AND ROBOTICS	3	0	0	0	3	3	ELM OR ET	
PEC-2	25ILA3203	EDGE COMPUTING FOR INDUSTRY 4.0	3	0	0	0	3	3	ELM OR ET	
PEC-3	25ILA3304	INDUSTRIAL DRIVES AND CONTROL	3	0	0	2	3.5	5	ELM OR ET	
PEC-4	25ILA3405	INDUSTRIAL COMMUNICATION PROTOCOLS AND CYBER SECURITY	3	0	0	0	3	3	ELM OR ET	
PEC-4	25ILA3406	DIGITAL MANUFACTURING AND DESIGN	3	0	0	0	3	3	ELM OR ET	
PEC-5	25ILA3507	SMART SENSORS AND NETWORKING	3	0	0	0	3	3	ELM OR ET	
PEC-5	25ILA3508	PLC PROGRAMMING & CONTROL	3	0	0	0	3	3	ELM OR ET	SMART GRID TECHNOLOGIES
PEC-1	25SGT3101	DISTRIBUTED ENERGY RESOURCES AND SMART GRIDS	3	0	2	0	4	5	EPGTD OR EPE	
PEC-2	25SGT3202	DISTRIBUTION SYSTEM PRACTICES	3	0	0	0	3	3	EPGTD OR EPE	
PEC-2	25SGT3203	MICROGRID DYNAMICS AND CONTROL	3	0	0	0	3	3	EPGTD OR EPE	
PEC-3	25SGT3304	ENERGY MANAGEMENT SYSTEMS AND SCADA	3	0	0	2	3.5	5	EPGTD OR EPE	
PEC-4	25SGT3405	SMART GRID COMMUNICATION AND CYBERSECURITY	3	0	0	0	3	3	EPGTD OR EPE	
PEC-4	25SGT3406	SMART METERS AND SMART CITIES	3	0	0	0	3	3	EPGTD OR EPE	



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PEC-5	25SGT3507	INTERNET OF THINGS AND SMART GRID ANALYTICS	3	0	0	0	3	3	EPGTD OR EPE
PEC-5	25SGT3508	SMART GRID PROTECTION	3	0	0	0	3	3	EPGTD OR EPE

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1. Course wise Syllabus revision of approved structure as mentioned in Program structure (with all Courses) containing following categorization).

Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Overall Revision Percentage
24EE2222F	Industrial Application of Electrical Machines	PCC	CO-1: Induction Motor testing: No load test, blocked rotor test & load test. Effect of rotor resistance, Circle diagram, crawling & cogging. Generator Operation, Doubly Fed Induction Generator. Starting methods of squirrel cage, and wound rotor induction motor. Speed control methods: Cascade connection. CO-2 Single phase induction motors- Constructional features, double-revolving field theory, equivalent circuit, determination of parameters. Split phase starting methods & applications. Shaded-pole Motor. CO3 Synchronous machines Performance and characteristics: regulation (EMF, MMF, and ZPF Methods), and parallel operation of generators- Synchronization and load division. Salient pole Machine- Two reaction theories, analysis of phasor diagram, power angle characteristics, determination of Xd and Xq. Operating characteristics Synchronous motor- V and inverted V curves. CO4 Special Purpose Motors: Brushless DC Motor: Constructional features, Principle of operation, Characteristics, Speed control, applications in robotics, electric vehicles, and HVAC systems. - Switched Reluctance Motor, Hysteresis Motor - Universal Motor- Linear Motor. Test the performance of Electrical Machines: Determination of Voltage Regulation of Synchronous Alternators and analyze the performance of Synchronous machines in different excitation conditions. Speed Control methods of Electrical Motors	CO-1: Induction Motor testing: No load test, blocked rotor test & load test. Effect of rotor resistance, Circle diagram, crawling & cogging. Generator Operation, Doubly Fed Induction Generator. Starting methods of squirrel cage, and wound rotor induction motor. Speed control methods: V/F speed control method, Cascade connection. CO-2 Single phase induction motors- Constructional features, double-revolving field theory, equivalent circuit, determination of parameters. Split phase starting methods & applications. Shaded-pole Motor. CO3 Synchronous machines Performance and characteristics: regulation (EMF, MMF, and ZPF Methods), and parallel operation of generators- Synchronization and load division. Salient pole Machine- Two reaction theories, analysis of phasor diagram, power angle characteristics, determination of Xd and Xq. Operating characteristics Synchronous motor- V and inverted V curves. CO4 Special Purpose Motors: Brushless DC Motor: Constructional features, Principle of operation, Characteristics, Speed control, applications in robotics, electric vehicles, and HVAC systems. - Switched Reluctance Motor, Hysteresis Motor - Universal Motor- Linear Motor. Test the performance of Electrical Machines: Determination of Voltage Regulation of Synchronous Alternators and analyze the performance of Synchronous machines in different excitation conditions. Speed Control methods of Electrical Motors	Topic Added: CO1: V/F speed control method CO2: Shaded-pole Motor. CO4: Characteristics, Speed control, applications in robotics, electric vehicles, and HVAC systems. - Switched Reluctance Motor, Hysteresis Motor - Universal Motor- Linear Motor.	No change	Academic Peer	25%

Sam

f. Pandian
Dr. A. PANDIAN, HOD
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Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Over/Revised/Percent
24EE3106R	Power System Analysis And Stability	PCC	CO-1: Power Flow Solutions: Network model formulation, Formation of YBUS by Direct Inspection Method, Formation of ZBUS, Power flow problem formulation, GS method, NR Method (Polar Coordinate Approach), FDLF. CO2: Symmetrical Fault Analysis: Representation of Power Systems Components, Per Unit System, Reactance diagrams, change of base values, Short circuit of synchronous machine unloaded, Calculation of symmetrical short circuit currents for simple systems. CO-3: Unsymmetrical Fault Analysis: Symmetrical components transformation, Sequence Impedance and Networks of Power System Components, Unsymmetrical Faults on an Unloaded Generator and Power Systems. CO-4 : Power System Stability: Dynamics of a synchronous machine, Swing equation, power angle equation, Single machine connected to infinite bus, two machine system, steady state stability, Transient stability analysis using Equal Area Criterion, critical clearing angle.	CO-1: Power Flow Solutions: Network model formulation, Formation of YBUS by Direct Inspection Method, Formation of ZBUS, Power flow problem formulation, GS method, NR Method (Polar Coordinate Approach), FDLF. CO2: Symmetrical Fault Analysis: Representation of Power Systems Components, Per Unit System, Reactance diagrams, change of base values, Short circuit of synchronous machine unloaded, Calculation of symmetrical short circuit currents for simple systems. CO-3: Unsymmetrical Fault Analysis: Symmetrical components transformation, Sequence Impedance and Networks of Power System Components, Unsymmetrical Faults on an Unloaded Generator and Power Systems. CO-4 : Power System Stability: Dynamics of a synchronous machine, Swing equation, power angle equation, Single machine connected to infinite bus, two machine system, steady state stability, Transient stability analysis using Equal Area Criterion, critical clearing angle, Point-by-point method	Topic Added: CO4: Point-by-point method	No change	To make students learn to Range-Kutta Method	2%

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Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for Modification	*Overall Revision Percentage
24EE2230F	CONTROL SYSTEMS	FCC	CO-1: Control System Concepts- Control system terminology, examples of simple control systems, open loop and closed loop control systems, Types of control systems. Mathematical models of physical systems- Analogy with mechanical systems, Formulation of differential equations for electrical systems Transfer functions of open and closed loop systems, DC & AC servomotors, block diagram representation of control systems, signal flow graph, Mason's gain formula CO-2: Time domain analysis: Standard test signals -step, ramp, parabolic and impulse, impulse response, transient response, characteristic equation of feedback systems, second order systems to standard test signals, time domain specifications, steady state error constants, Introduction to P, PI, PID controllers. Stability analysis: Concept of stability and conditions for stability, Routh - Hurwitz criterion, dominant poles of magnitude and angle conditions, properties, and input/output/transfer function. Root Locus Technique- The root construction of the complex root loci. CO-3: Frequency response Analysis & Design: Introduction, frequency response specifications, correlation between time and frequency response, variables, state vector, input vector, output vector, development of state models for simple systems, Concepts of controllability and observability. CO-4: State space analysis: Concepts of state, process control through PLC: Basic PLC architecture - state variables, state vector, input/output/transfer function, I/O Modules, programming formats, I/O vector; development of state models for simple devices, PLC programming- input/output/contact and output/coil systems, Concepts of controllability and instructions, control process to PLC logic diagram, ladder diagram for basic control processes	CO-1: Control System Concepts- Control system terminology, examples of simple control systems, open loop and closed loop control systems, Types of control systems. Mathematical models of physical systems- Analogy with mechanical systems, Formulation of differential equations for electrical systems Transfer functions of open and closed loop systems, DC & AC servomotors, block diagram representation of control systems, signal flow graph, Mason's gain formula CO-2: Time domain analysis: Standard test signals -step, ramp, parabolic and impulse, impulse response, transient response, characteristic equation of feedback systems, second order systems to standard test signals, time domain specifications, steady state error constants, Introduction to P, PI, PID controllers. Stability analysis: Concept of stability and conditions for stability, Routh - Hurwitz criterion, dominant poles of magnitude and angle conditions, properties, and input/output/transfer function. Root Locus Technique- The root construction of the complex root loci. CO-3: Frequency response Analysis & Design: Introduction, frequency response specifications, correlation between time and frequency response, variables, state vector, input vector, output vector, development of state models for simple systems, Concepts of controllability and observability. CO-4: State space analysis: Concepts of state, process control through PLC: Basic PLC architecture - state variables, state vector, input/output/transfer function, I/O Modules, programming formats, I/O vector; development of state models for simple devices, PLC programming- input/output/contact and output/coil systems, Concepts of controllability and instructions, control process to PLC logic diagram, ladder diagram for basic control processes	CO4: Process programming formats, I/O devices, PLC input/output/contact and output/coil instructions, correlation control process between time and frequency response, polar to PLC logic diagram, ladder diagram for state, state diagram for basic control processes	No change	No Alumni	15%

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24AAS3102	AI AND CONTROLS FOR AUTONOMOUS FUTURE TRANSPORT	PEC	CO1: Fundamentals of Autonomous vehicle: Introduction to autonomous vehicles, Vehicle dynamics and control, Sensor fusion and perception, Path planning and motion planning, Control system design for autonomous vehicles. CO2: AI for Autonomous Vehicle: Autonomous driving - Machine learning and deep learning, Computer vision and image processing for perception, Natural language processing for human-vehicle interaction, Reinforcement learning for autonomous decision-making. CO3: EV Fundamentals: Electric vehicle components and systems, Battery technology and management, Electric powertrain and control, Energy management strategies, Charging Infrastructure and Power Electronics. CO4: AI for Electrical Vehicle: Battery management and state estimation with AI, Electric powertrain optimization strategies, AI for charging infrastructure management, AI for vehicle-to-grid (V2G) interactions, Energy-efficient autonomous driving, AI-based predictive control for EVs, Challenges and future directions	CO1: Fundamentals of Autonomous vehicle: Introduction to autonomous vehicles, Vehicle dynamics and control, Sensor fusion and perception, Path planning and motion planning, Control system design for autonomous vehicles. CO2: AI for Autonomous Vehicle: Autonomous driving - Machine learning and deep learning, Computer vision and image processing for perception, Natural language processing for human-vehicle interaction, Reinforcement learning for autonomous decision-making. CO3: EV Fundamentals: Electric vehicle components and systems, Battery technology and management, Electric powertrain and control, Energy management strategies, Charging Infrastructure and Power Electronics. CO4: AI for Electrical Vehicle: Battery management and state estimation with AI, Electric powertrain optimization strategies, AI for charging infrastructure management, AI for vehicle-to-grid (V2G) interactions, Energy-efficient autonomous driving, AI-based predictive control for EVs, Challenges and future directions	Change L-T-P-S, Removed Skill component	yes	To motivate students to do concern skill courses	10%



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24AAS3309	AUTONOMOUS ELECTRIC MOBILITY - SYSTEMS AND APPLICATIONS	PEC	Overview of Autonomous Vehicle Design, Applications and its principles, Autonomous parking, Blind Spot Monitoring, Autonomous Emergency Braking, Lane Keeping Assist, AI/ML algorithm for Autonomous vehicle applications, Software Design consideration - AUTOSAR stack Overview of Electric Vehicle Design, Features and its principles, Cell Balancing, Regenerative Braking, Thermal Management, Energy Management, AI/ML algorithm for Autonomous vehicle applications, Software Design consideration AUTOSAR Stack Artificial Intelligence and IoT in Autonomous Applications, Cloud Computing and Big Data, Challenges in AI-driven Automated Vehicles, Various Learning Methods, Statistical Learning, Deep Learning Deep Reinforcement Optimizing Traffic flow with V2V communication, Traffic Management with V2I, Parking Management with V2V, Energy Management with V2G, Gateway ECU Design, Software Stack and Design Consideration Legal and Regulatory Compliance, ISO 26262 Functional Safety-International Standards, Management of functional safety, Hazard analysis and Risk assessment, Product development, Adaptation in EV and AV, ASIL and Safety oriented analysis, UNECE Regulation No. 19, SAE International Standards, Hazard Identification and Risk Management, Safety Goals and Safety Mechanism, Cybersecurity-An Overview	Same as old syllabus	Change L-T-P-S, Removed practical component	yes	Faculty	10%

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24EME3101	POWER TRAIN DESIGN FOR ELECTRIC VEHICLE	PEC	HISTORY, ECONOMIC & ENVIRONMENTAL IMPACT OF ELECTRIC VEHICLE: History of EV, Case studies on Economic and Environment aspects of EV, Classification of electric vehicle, Modern electric drive train, Power components: BEV, HEV, PHEV and FCEV, including working of Fuel cell, Super capacitor, energy management, Hybrid sources. ELECTRIC VEHICLE DYNAMICS: Laws of Motion, General description of vehicle movement, Tractive Effort, Vehicle resistance: Rolling Resistance, Aerodynamic Drag, Grading Resistance, Acceleration resistance, Dynamic equation, Tire Ground Adhesion and maximum tractive effort, Vehicle Power Plant and Transmission Characteristics. MODELING VEHICLE ACCELERATION & ELECTRIC VEHICLE RANGE: Acceleration performance parameters, Modeling the acceleration of an electric scooter, Modeling the acceleration of a small car, Driving cycles, Range modeling of battery electric vehicles, Constant velocity range modeling of fuel cell vehicles, Range modeling of hybrid electric vehicles. Fundamentals of Regenerative Braking Energy Consumption in Braking, Braking Power and Energy on Front and Rear Wheels, Brake System of EVs and HEVs, Series Brake, Optimal Energy Recovery, Parallel Brake, Antilock Brake System (ABS). Testing of the Power train components of EV, Test the Range of vehicle for different Driving cycles	HISTORY, ECONOMIC & ENVIRONMENTAL IMPACT OF ELECTRIC VEHICLE: History of EV, Case studies on Economic and Environment aspects of EV, Classification of electric vehicle, Modern electric drive train, Power train components: BEV, HEV, PHEV and FCEV, including working of Fuel cell, Super capacitor, energy management, Hybrid sources. ELECTRIC VEHICLE DYNAMICS: Laws of Motion, General description of vehicle movement, Tractive Effort, Vehicle resistance: Rolling Resistance, Aerodynamic Drag, Grading Resistance, Acceleration resistance, Dynamic equation, Tire Ground Adhesion and maximum tractive effort, Vehicle Power Plant and Transmission Characteristics. MODELING VEHICLE ACCELERATION & ELECTRIC VEHICLE RANGE: Acceleration performance parameters, Modeling the acceleration of an electric scooter, Modeling the acceleration of a small car, Driving cycles, Range modeling of battery electric vehicles, Constant velocity range modeling of fuel cell vehicles, Range modeling of hybrid electric vehicles. Fundamentals of Regenerative Braking Energy Consumption in Braking, Braking Power and Energy on Front and Rear Wheels, Brake System of EVs and HEVs, Series Brake, Optimal Feel, Series Brake, Optimal Energy Recovery, Parallel Brake, Antilock Brake System (ABS). Testing of the Power train components of EV, Test the Range of vehicle for different Driving cycles	Change L-T-P-S, Removed Skill component	yes	To motivate students to do concern skill courses	10%

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24EME3304	CHARGING STATIONS FOR ELECTRIC VEHICLES	PEC	Overview of power levels ,DC conductive charging, AC conductive charging, Low power Charger, Automotive standard charger, Charging Modes Constant-current charging, Constant-voltage charging, Pulse Charging, Reflex charging, Trickle Charge, Load management at charging station and peak load management Power Electronics for EV Battery Charging Forward Flyback Converters, Half-Bridge DC DC Converter, Full-Bridge DC DC Converter, Power Factor Correction, Bidirectional Battery Chargers, Dual active bridge dc dc converter, Solar charging station. Charging Infrastructure Charger - Existing National & International Charger Architecture Standards - SAE J1773, VDE-ARE 2623-2-2, JEVS G105-1993 (CHADEMO), CCS, Type-1 AC, Type-2 AC, Bharat DC-001, Bharat AC-001. Cords and Cables, Earthing, Fault Protection, Testing, Charging Safety, Protection against electric shock, Digital Communication between EV and Charging Station. Installation Govt. of India guideline on Public Charging Stations, IEC Standards- 60068-2(1, 2, 14, 30), 61683, 60227, 60502, 60947 part I,II, III and 61215. Site assessment, EVSE Typical Site Plans, Design Guidelines and Site Drawings, Planning Considerations, Station Configuration, Selection and erection of electrical equipment - Isolation, switching and control.	Overview of power levels ,DC conductive charging, AC conductive charging, Low power Charger, Automotive standard charger, Charging Modes Constant-current charging, Constant-voltage charging, Pulse Charging, Reflex charging, Trickle Charge, Load management at charging station and peak load management Power Electronics for EV Battery Charging Forward Flyback Converters, Half-Bridge DC DC Converter, Full-Bridge DC DC Converter, Power Factor Correction, Bidirectional Battery Chargers, Dual active bridge dc dc converter, Solar charging station. Charging Infrastructure Charger - Existing National & International Charger Architecture Standards - SAE J1773, VDE-ARE 2623-2-2, JEVS G105-1993 (CHADEMO), CCS, Type-1 AC, Type-2 AC, Bharat DC-001, Bharat AC-001. Cords and Cables, Earthing, Fault Protection, Testing, Charging Safety, Protection against electric shock, Digital Communication between EV and Charging Station. Installation Govt. of India guideline on Public Charging Stations, IEC Standards- 60068-2(1, 2, 14, 30), 61683, 60227, 60502, 60947 part I,II, III and 61215. Site assessment, EVSE Typical Site Plans, Design Guidelines and Site Drawings, Planning Considerations, Station Configuration, Selection and erection of electrical equipment - Isolation, switching and control.	Change L-T-P-S, Removed practical component	yes	Faculty	10%

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24GET3101	SOLAR PV AND MICRO ENERGY TECHNOLOGIES	PEC	Solar PV energy conversion: Generic Photovoltaic Cell, Equivalent Circuits, Cells to Arrays, IV Curve, Impacts of Temperature and Insolation, Shading impacts on IV curves, MPPT, System sizing, System Performance. Modelling of Solar PV system components: Mathematical models of PV cell, PV Array, Battery pack, grid connected and isolated modes of operation, MPPT techniques. Fuel Cell energy conversion: PEM Fuel Cells, Solid Oxide Fuel Cells, Electrolyzes, Power Electronic Interfacing Circuits, Standalone and Grid Connected Fuel Cell Power Generation Systems, Hybrid Fuel Cell Based Energy System Case. Micro Energy Sources: Ocean Thermal energy conversion, Geo-thermal energy conversion, Tidal Energy conversion, Biomass energy, Biogas plants and Batteries	Solar PV energy conversion: Generic Photovoltaic Cell, Equivalent Circuits, Cells to Modules to Arrays, IV Curve, Impacts of Temperature and Insolation, Shading impacts on IV curves, MPPT, System sizing, System Performance. Modelling of Solar PV system components: Mathematical models of PV cell, PV Array, Battery pack, grid connected and isolated modes of operation, MPPT techniques. Fuel Cell energy conversion: PEM Fuel Cells, Solid Oxide Fuel Cells, Electrolyzes, Power Electronic Interfacing Circuits, Standalone and Grid Connected Fuel Cell Power Generation Systems, Hybrid Fuel Cell Based Energy System Case. Micro Energy Sources: Ocean Thermal energy conversion, Geo-thermal energy conversion, Tidal Energy conversion, Biomass energy, Biogas plants and Batteries	Change L-T-P-S, Remove d Skill compone nt	yes	To motivate students to do concern skill courses	10%

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24GET3304	GRID INTEGRATION OF RENEWABLE ENERGY SOURCES	PEC	PV Integration Technology: Introduction, Photovoltaic (PV) inverter topologies- configurations and control strategies, Grid codes and technical regulations of Solar PV integration. Case study. Wind Power Integration Technology: Wind power and voltage control for synchronous and induction generators-based integration; active and reactive power control, Grid codes and technical regulations of Wind power integration. Case study. Power quality management: THD, voltage sag, voltage swell, frequency change and its effects, network voltage management- PV & Wind power, frequency management, effects on system stability, PLL, Modulation Techniques, Dimensioning of filters. Challenges: Integrating multiple renewable energy sources; DC link integration; AC link integration; Integration of DC micro-grid to the main AC grid using a 3-phase inverter, HFAC link integration; islanding and interconnection.	PV Integration Technology: Introduction, Photovoltaic (PV) inverter topologies- configurations and control strategies, Grid codes and technical regulations of Solar PV integration. Case study. Wind Power Integration Technology: Wind power and voltage control for synchronous and induction generators-based integration; active and reactive power control, Grid codes and technical regulations of Wind power integration. Case study. Power quality management: THD, voltage sag, voltage swell, frequency change and its effects, network voltage management- PV & Wind power, frequency management, effects on system stability, PLL, Modulation Techniques, Dimensioning of filters. Challenges: Integrating multiple renewable energy sources; DC link integration; AC link integration; Integration of DC micro-grid to the main AC grid using a 3-phase inverter, HFAC link integration; islanding and interconnection.	Change L-T-P-S, Removed practical componen	yes	Faculty	10%

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24ILA3101	INTRODUCTION TO INDUSTRIAL INTERNET OF THINGS	PEC	Definition of industrial automation, Mechanization vs automation, advantages of automation, goals of automation, reasons for automation, social issues of automation, types of automation, current emphasis in automation, Controllers Employed in Automated Systems, Case Studies. Introduction & Automatic Process Control, Building Blocks of Automation Systems: LAN, Analog & Digital I/O Modules Distributed Control System: Functional Requirements, Configurations & some popular Distributed Control Systems. Industrial automation and Case studies Specifications and Characteristics, Criteria for selection. Dynamic properties of robots-stability, control resolution, spatial resolution, accuracy, repeatability, compliance, work cell control, Interlocks Robotic Control Systems-Robot Motions, Drives, Actuators, Robot controllers, Power transmission systems. Transducers and sensors: sensors in robotics and their classification, vision sensors, touch (tactile) sensors, proximity and range sensors, force and torque sensing. End Effectors-Types, grippers, various process tools as end effectors, Robot-End effectors interface, Active and passive compliance, Gripper selection and design. Robot Programming: Level of robot programming, Language based programming, task level programming, Robot programming synthesis,	Definition of industrial automation, Mechanization vs automation, advantages of automation, goals of automation, reasons for automation, social issues of automation, types of automation, current emphasis in automation, Controllers Employed in Automated Systems, Case Studies. Introduction & Automatic Process Control, Building Blocks of Automation Systems: LAN, Analog & Digital I/O Modules Distributed Control System: Functional Requirements, Configurations & some popular Distributed Control Systems. Industrial automation and Case studies Specifications and Characteristics, Criteria for selection. Dynamic properties of robots-stability, control resolution, spatial resolution, accuracy, repeatability, compliance, work cell control, Interlocks Robotic Control Systems-Robot Motions, Drives, Actuators, Robot controllers, Power transmission systems. Transducers and sensors: sensors in robotics and their classification, vision sensors, touch (tactile) sensors, proximity and range sensors, force and torque sensing. End Effectors-Types, grippers, various process tools as end effectors, Robot-End effectors interface, Active and passive compliance, Gripper selection and design. Robot Programming: Level of robot programming, Language based programming, task level programming, Robot programming synthesis,	Change L-T-P-S, Removed Skill component	yes	To motivate students to do concern skill courses	10%

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		Industrial Applications and Case Studies.		Industrial Applications and Case Studies.					
Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Overall Revision Percentage	
24ILA3304	INDUSTRIAL DRIVES AND CONTROL		Electric drive components, power converters and motors, load torque components, types of industrial loads, intermittent loads, stability, choice of drive, selection and sizing of drive case study. Mathematical models- DC Motor, DC-DC Converter, Speed Sensing, Current sensing, Analysis of current loop, Analysis of speed loop, digital control implementation of dc drive. Induction motor torque expression, effect of harmonics in input voltage, v/f control, analog SPWM implementation, static rotor resistance control, Park\'s Transformation, Clarke\'s Transformation, three phase induction motor model in rotating frame of reference, Space vector modulation, Direct torque control. PLC based control- PID control of dc drive, Bi-directional control of dc motor, induction motor starting, VFD control, temperature and vibration control.	Electric drive components, power converters and motors, load torque components, types of industrial loads, intermittent loads, stability, choice of drive, selection and sizing of drive case study. Mathematical models- DC Motor, DC-DC Converter, Speed Sensing, Current sensing, Analysis of current loop, Analysis of speed loop, digital control implementation of dc drive. Induction motor torque expression, effect of harmonics in input voltage, v/f control, analog SPWM implementation, static rotor resistance control, Park\'s Transformation, Clarke\'s Transformation, three phase induction motor model in rotating frame of reference, Space vector modulation, Direct torque control. PLC based control- PID control of dc drive, Bi-directional control of dc motor, induction motor starting, VFD control, temperature and vibration control.	Change L-T-P-S, Removed practical component	yes	Faculty	10%	





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24SGT3101	DISTRIBUTED ENERGY RESOURCES AND SMART GRIDS	PEC	Distributed Energy Resources: Introduction, combined heat and power (CHP) systems, solar photovoltaic (PV) systems, Wind energy systems, Wind energy conversion systems (WECS), small-scale hydroelectric power generation, batteries, ultra-capacitors, flywheels. Integration of Distributed Generation to Grid: Introduction, concepts of micro grid, typical micro-grid configurations, AC and DC of micro-grids, interconnection of micro-grids, protection and control issues in micro-grids. Introduction to Smart Grid: Introduction to smart grid, architecture of smart grid, smart grid standards and policies, smart grid components, smart grid technologies. Smart Grid Monitoring: Load dispatch area monitoring system (WAMS), PMU; Smart sensors/telemetry, advanced metering infrastructure (AMI); smart metering; demand side management.	Distributed Energy Resources: Introduction, combined heat and power (CHP) systems, solar photovoltaic (PV) systems, Wind energy conversion systems (WECS), small-scale hydroelectric power generation, batteries, ultra-capacitors, flywheels. Integration of Distributed Generation to Grid: Introduction, concepts of micro grid, typical micro-grid configurations, AC and DC of micro-grids, interconnection of micro-grids, protection and control issues in micro-grids. Introduction to Smart Grid: Introduction to smart grid, architecture of smart grid, smart grid standards and policies, smart grid components, smart grid technologies. Smart Grid Monitoring: Load dispatch area monitoring system (WAMS), PMU; Smart sensors/telemetry, advanced metering infrastructure (AMI); smart metering; demand side management.	Change L-T-P-S, Remove Skill component	yes	To motivate students to do concern skill courses	10%

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24SGT3304	ENERGY MANAGEMENT SYSTEMS AND SCADA	PEC	Data acquisition systems, Evolution of SCADA, Communication technologies, Monitoring and supervisory functions, SCADA System Components. SCADA Architecture: Various SCADA architectures, advantages and disadvantages of each system - single system - single unified standard architecture - IEC 61850. SCADA Communication. Utility applications. Transmission and Distribution sector - operations, monitoring, analysis and improvement. Introduction, Smart substations, Substation Automation, SCADA ,Remote Terminal Unit, Protocols, Phasor Measurement Unit, Smart integration of energy resources, Renewable, intermittent power sources, Energy Storage. Introduction, VoltVAR control, Fault Detection, Isolation and Service Restoration, Network Reconfiguration, Outage management System, CIS and Load Management Systems, functions of load management systems: Load analysis and forecasting, remote automatic meter reading.	Data acquisition systems, Evolution of SCADA, Communication technologies, Monitoring and supervisory functions, SCADA System Components. SCADA Architecture: Various SCADA architectures, advantages and disadvantages of each system - single unified standard architecture - IEC 61850. SCADA Communication. Utility applications. Transmission and Distribution sector - operations, monitoring, analysis and improvement. Introduction, Smart substations, Substation Automation, Feeder Automation, SCADA ,Remote Terminal Unit, Protocols, Phasor Measurement Unit, Smart integration of energy resources, Renewable, intermittent power sources, Energy Storage. Introduction, VoltVAR control, Fault Detection, Isolation and Service Restoration, Network Reconfiguration, Outage management System, CIS and GLS, Load Management Systems, functions of load management systems: Load analysis and forecasting, remote automatic meter reading.	Change L-T-P-S, Removed practical component	yes	Faculty	10%



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Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Overall Revision Percentage
24SDEE01	VISUALIZATION AND MODELING OF CIRCUITS	PEC	AutoCAD Electrical: Basics of Electrical Drawings, Introduction to AutoCAD Electrical and Interface, project manager, Basics of project manager, Common Symbols in Electrical Drawings, Wire and its Types, Labelling - Install and configure AutoCAD Electrical Start AutoCAD, understand the initial AutoCAD Electrical screen, commands, components of the initial AutoCAD Electrical various commands to save a file, Exit AutoCAD, Create screen, commands, various commands to manage workspaces, Using various options in AutoCAD, Create and manage AutoCAD help. Case Study-Detailed Project Report. Workflow in AutoCAD Electrical, Starting a project, Adding drawings in the project, Inserting Components using New Project, Changing Properties of a project, Adding drawings in the project, Inserting Equipment list, Panel list, Terminal (Panel list) Single Line Components using Icon menu, Catalog components. Inserting Wires, applying wire numbers, diagram, Browser, User Defined list, Equipment list, inserting user defined circuits , ladders , Cable System Panel list, Terminal (Panel list) components. Markers and Circuit Builders. Inserting Parametric layout: Inserting Wires, applying wire numbers, PLCs, connectors and terminals. Case Study-Create Substation, inserting user defined circuits, ladders, Cable Commercial and Domestic building. Markers and Circuit Builders. Inserting Parametric layout: layouts from schematic list, create panel layouts from components schematic list, Annotate and edit a footprint, insert of Substation, schematic list, create panel layouts from footprints from icon menu, add a new record of preparation schematic list, Annotate and edit a footprint, footprint to the footprint lookup table. Case study of Bill of insert footprints from icon menu, add a new Industrial Electric HVAC. System layout: Create materials, record of footprint to the footprint lookup Substation, create components of Substation, Case study of table. Case study of Industrial Electric HVAC. preparation of Bill of materials, Case study of Distribution	AutoCAD Electrical: Basics of Electrical Drawings, Added Drawings, Introduction to AutoCAD Electrical and Interface, CO1: Case and Interface, project manager, Basics of project manager, Basics of Electrical Drawings- Study- Electrical Drawings- Common Symbols in Electrical Drawings, Wire and its Detailed Electrical Drawings, Labelling - Install and configure AutoCAD Project Labelling - Install and configure AutoCAD Electrical Start AutoCAD, understand components of Report. Electrical Start AutoCAD, understand the initial AutoCAD Electrical screen, commands, components of the initial AutoCAD Electrical various commands to save a file, Exit AutoCAD, Create CO2: Case screen, commands, various commands to manage workspaces, Using various options in Study- save a file, Exit AutoCAD, Create and manage AutoCAD help. Case Study-Detailed Project Report. Commercial workspaces, Using various options in AutoCAD Workflow in AutoCAD Electrical, Starting a New and Domestic Project, Changing Properties of a project, Adding building.	No	Faculty	25 %	

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				Distribution Substation	Substation				
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Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Over all Revision on Percentage
24SDEE05	MODELING AND SIMULATION OF GREEN ENERGY SYSTEMS	PEC	Overview of MATLAB simulation, fundamentals of solar PV and wind energy conversion system. Solar PV System: V-I characteristics, effect of temperature, shading effect, fill factor, efficiency, irradiance impact, series and parallel connection of solar cells. Wind Energy Conversion Systems: Power curve, effect of varying wind speeds, tip-speed ratio, impact of blade pitch angle.	Overview of MATLAB simulation, fundamentals of solar PV and wind energy conversion system. Solar PV System: V-I characteristics, effect of temperature, shading effect, fill factor, efficiency, irradiance impact, series and parallel connection of solar cells. Wind Energy Conversion Systems: Power curve, effect of varying wind speeds, tip-speed ratio, impact of blade pitch angle. Energy Storage Systems, Fuel Cells, Hybrid Distributed Generation systems.	Added: Co3: Energy Storage Systems, Fuel Cells, Hybrid Distributed Generation systems.	yes	As per feedback received from SGT research group	20%

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Course Code	Course Name	Course Category	Existing Syllabus (as per Annexure-3)	New Syllabus (as per Annexure-3)	Topics Added/Removed/Replaced	Change in Outcome	Justification for the Modification	*Overall Revision on Percentage
24SDEE05	MODELING AND SIMULATION OF GREEN ENERGY SYSTEMS		Basic circuit elements, Circuit fundamental: Mesh analysis and Nodal analysis, Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum power transfer theorem. AC fundamentals: RMS value, Average Values, Form & Peak factor, Steady state analysis (R, L, C, etc), Reactance, Impedance, Phase & Phase difference, Real power, Reactive power, Power factor. Operation of the diode, Diode as a switch, Rectifiers, Clipper, Clampers, Zener Diode as a regulator, Operation of Transistor, Transistor as a switch. Analog & Digital ICs: Voltage regulators 7805, 7905, and LM723, Operational Amplifiers IC 741, Timer IC 555, Comparators LM 339	AC & DC Fundamentals: DC Fundamentals: Basic Circuit Elements and Sources, Series and Parallel Connection of Circuit Elements, Star - Delta Transformation, Ohm's Law, Kirchhoff's Laws AC Fundamentals: Peak Value, Time Period, Frequency, RMS & Average Values, Form Factor, Peak Factor and Power Factor Circuit Analysis Techniques: Mesh Analysis, Nodal Analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem Steady State Analysis of RL, RC, RLC Circuits, Resonance and its Parameters (Resonant Frequency, Q-Factor, Bandwidth) Semiconductor Devices: PN Junction Diode (Operation, V-I Characteristics), Applications: Diode as a Switch, Rectifiers (HWR, FWR), Clippers and Clampers, Operation of Zener Diode (Breakdown), Zener as a Voltage Regulator, LED Bipolar Junction Transistor: Operation of a Transistor, Input and Output Characteristics of CB, CE, CC Configurations, Transistor as a Switch Analog Integrated Circuits: Operational Amplifiers (IC 741), Ideal and Practical Characteristics, Inverting and Non-Inverting amplifiers and Applications of Op-Amp IC 555 Timer and Applications, Voltage Regulators: 78XX, 79XX and LM723.	L-T-P_S is changed from 2-0-0-0, Ce:2 to 3-0-2-0 Cr:4 Added: CO1: Star - Delta Transformation Co3: Resonance and its Parameter s (Resonant Frequency, Q-Factor, Bandwidth).	yes	As per feedback received from ECE research groups	25%

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COURSE CODE	25SC2007	COURSE CATEGORY			ESC		
COURSE TITLE	PYTHON PROGRAMMING	L	T	P	S	Cr	CH
		2	0	2	0	4.5	7
Pre-Requisite Course(s)	Basic Computer Knowledge, Basic Mathematics, Logic and Problem-Solving Skills	Course Offering Department			AI&DS		

COURSE OUTCOMES:

CO NO.	COURSE COUTCOME (CO)	PO/PSO	BTL
CO-1	Apply the concepts of Basic Data types, Operators, Decision and Looping Control Statements, String	PO1, PO2, PO3, PO5	3
CO-2	Apply the concepts of Lists, Tuples, Dictionaries. Functions, Modules, Class, Object, OOPS principles.	PO1, PO2, PO3, PO5	3
CO-3	Apply Concepts of OOP principles, classes and objects, Call by value vs. Call by reference, recursion, and Nested classes	PO1, PO2, PO3, PO5	3
CO-4	Apply Concepts of Files, Interfaces, Packages, Threads	PO1, PO2, PO3, PO5	3
CO-5	Design, implement, and evaluate Python programs using basic data types, variables, expressions, conditional statements, loops, functions, built-in data structures, object-oriented programming concepts, Python libraries and modules, debugging techniques, and file I/O to solve programming problems.	PO1, PO2, PO3, PO5, PO9, PO11	4

SYLLABUS:

CO 1	Python interpreter and interactive mode; values and types: int, float, Boolean, string, and list, variables, expressions, statements, tuple assignment, precedence of operators, comments, Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Strings: string slices, immutability, string functions and methods, string module
CO-2	Fruitful functions: functions, function definition and use, flow of execution, parameters and arguments return values, parameters, local and global scope; List, Tuples, Set, Dictionary data types, Classes, Object: command line arguments, Class, object, methods, constructors, OOP's principles.
CO-3	Polymorphism: Static and Dynamic Polymorphism (Overloading, Overriding), Inheritance – Super classes- sub classes –Protected members – constructors in sub classes, Super keyword, Encapsulation: Data Encapsulation and Data Abstraction, Object as argument and return value: Call by value vs. Call by reference, recursion, and Nested classes
CO-4	Files, Interfaces, Packages, and Threads: Introduction to files: Create, Read Write, Append, Delete Interfaces – defining an interface, implementing & Applying interface, differences between classes and Interfaces and extending interfaces, Packages, importing packages, Exception Exceptions – exception hierarchy – throwing and catching exceptions – built-in exceptions, creating own exceptions fundamentals, Threads: Difference between multi- threading and Multitasking, Different Thread objects

TEXTBOOKS:



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1	Allen B. Downey, Think Python: How to Think like a Computer Scientist, 2nd Edition, O'Reilly Publishers, 2016
2	Paul Deltel and Harvey Deitel, Python for Programmers, 1st Edition, 2021, Pearson Education
3	Dusty Phillips, Python 3 Object-oriented Programming, 2nd Edition, Packt Publishing



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COURSE CODE	25EC1102	COURSE CATEGORY			ESC		
COURSE TITLE	DIGITAL SYSTEM DESIGN	L	T	P	S	Cr	CH
		3	0	2	0	4	5
Pre-Requisite Course(s)	NIL	Course Offering Department			ECE		

COURSE OUTCOMES:

CO NO.	COURSE COUTCOME (CO)	PO/PSO	BTL
CO-1	Understand fundamental concepts of number systems, code conversions, Boolean algebra and logic minimization.	PSO1	2
CO-2	Design combinational logic circuits using logic minimization techniques	PSO1,PO1, PO2	3
CO-3	Design sequential circuits using flip-flops, counters, and registers.	PSO1,PO1, PO2	3
CO-4	Build logic functions using Programmable Logic Devices (PLDs).	PSO1,PO1, PO2	3
CO-5	Develop and Analyze various digital logic circuits using combinational, sequential and FSM models for real time applications	PSO1,PO1,PO3, PO5	4

SYLLABUS:

MODULE - 1	Fundamentals of Digital systems: Introduction to Digital systems, Number Systems, Signed number Representation, Binary codes, Code Conversion, Logic gates, Boolean Algebra and Minimization techniques: SOP & POS forms, Karnaugh maps (upto 4 variables).
MODULE - 2	Combinational Logic Circuits: Design Procedure for combinational logic circuit, Adder and Subtractor, Encoders, Decoders, Multiplexers, De-multiplexers, Magnitude Comparators, Parity Generators and Checkers, BCD to seven segment decoder.
MODULE - 3	Sequential Logic Circuits: Latches, Buffer, and Flip-Flops, Registers and Counters: Shift registers and types, Design of Synchronous and Asynchronous Counters, Modulus counters, Finite state machines: Moore and Mealy machines, Introduction to Threshold Logic, Sequence Generator and Sequence Detector.
MODULE - 4	Programmable Logic Devices: Programmable Read only Memory (PROM), Programmable Array Logic (PAL), Programmable Logic Array (PLA), Designs using Programmable Devices. Complex Programmable Logic Devices, Field Programmable Gate Arrays, Applications of CPLDs and FPGAs.

REFERENCE BOOKS:



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1	M.Morris Mano, "Digital Logic and Computer Design", Pearson publication, 5th Edition – 2013.
2	Stephen Brown, Zvonko Vranesic "Fundamentals of Digital Logic with Verilog Design" McGraw-Hill., 3rd Edition.
3	Zvi Kohavi, Switching and Finite Automata Theory, McGraw-Hill computer science series, 2nd Edition.
4	A Anand Kumar, "Digital Fundamentals", PHI publication, 4th edition-2016.
5	R.P. Jain, "Modern digital Electronics", Tata McGraw Hill, 4th edition-2009.
6	Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, "Digital Systems Principles and Applications", Prentice Hall, 10th edition-2014.



PLC and SCADA

	CO	BTL	Pos/PSOs
1	Apply the fundamentals of PLC architecture, I/O processing, signal conditioning, and wiring techniques to design and troubleshoot basic automation circuits.	3	PO1, PO3, PSO1
2	Develop ladder logic programs using timers, counters, shift registers, arithmetic/logical functions, and implement basic control strategies for industrial processes.	3	PO1, PO5, PSO1
3	Interface PLC with various field devices such as sensors, transducers, and motor drives to automate real-world applications	3	PO1, PO5, PSO1
4	Integrate SCADA systems with PLCs, demonstrating communication protocols, architecture, and automation of power systems and industrial plants using modern engineering tools.	3	PO1, PO5, PSO1
5	Develop and implement ladder logic programs using PLC to control industrial processes and interface with SCADA systems for real-time monitoring and automation.	4	PO5, PSO1

Module 1: PLC and I/O processing: Programmable Logic Controller basics, overview of PLC systems – Architecture of PLC, Principle of Operation, input/output Units – power supplies and isolators, current sinking and current sourcing, types of PLC memory, fundamental PLC wiring diagram, relays, switches, transducers, sensors – seal-in circuits. Input/output units Signal conditioning. Remote connections Networks Processing inputs I/O addresses

Module 2: Programming of PLC: Fundamentals of logic, PLC programming languages. Ladder diagrams, Ladder Diagram Instruction, Logic functions, Latching, Multiple outputs. Timer and counter- types along with timing diagrams, shift registers, sequencer function, latch instruction; Arithmetic and logical instruction with various examples. ON/OFF switching devices, I/O analog devices, Analog PLC operation, PID control of continuous processes, simple closed loop systems, closed loop system using Proportional, Integral & Derivative (PID), PLC interface, and Industrial process example.

Module 3: PLC interface to various circuits: Encoders, transducer and advanced sensors. Measurement of temperature, flow, pressure, force, displacement, speed, level. Developing a ladder logic for Sequencing of motors, Tank level control, ON-OFF temperature control, elevator, bottle filling plant, car parking etc. Motors Controls: AC Motor starter, AC motor overload protection, DC motor controller, Variable speed (Variable Frequency) AC motor Drive.

Module 4: SCADA Systems: Introduction, Communication requirements, Desirable Properties of SCADA system, features, advantages, disadvantages and applications of SCADA. SCADA Architectures (First generation - Monolithic, second generation - Distributed, Third generation – Networked Architecture), SCADA systems in operation and control of interconnected power system, Power System Automation (Automatic substation control and power distribution). Open systems interconnection (OSI) Model, Process Field bus (Profibus). Interfacing of SCADA with PLC.

Reference Books:

1. Gary Dunning, "Introduction to Programmable Logic Controllers", Thomson, 2nd Edition.



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2. John R. Hackworth, Frederick D., Hackworth Jr., "Programmable Logic Controllers Programming Methods and Applications", PHI Publishers.
3. John W. Webb, Ronald A. Reis, "Programmable Logic Controllers: Principles and Application", PHI Learning, New Delhi, 5th Edition.
4. Stuart A Boyer, "SCADA supervisory control and data acquisition", ISA, 4th Revised edition
5. L.A. Bryan, E. A. Bryan, "Programmable Controllers Theory and Implementation" Industrial Text Company Publication, Second Edition.

Y25 M.TECH (ELECTRICAL & ELECTRONICS ENGINEERING) STRUCTURE

Sl No	COURSE CAT	COURSE CODE	COURSE TITLE	SHORT NAME	L	T	P	S	Cr	CH	PRE-REQUI SITE
1	AUC	25UC5201	PROFESSIONAL COMMUNICATION SKILLS	PCS	0	0	4	0	0	4	NIL
2	AUC	25EE5207	MATLAB PROGRAMMING FOR ENGINEERS	MATLAB	0	0	4	0	0	4	NIL
3	ESC	25EE5101	PYTHON PROGRAMMING FOR ELECTRICAL SYSTEMS	PPES	3	0	2	0	4	5	NIL
4	PCC	25EE5102	ADVANCED POWER CONVERTERS	APC	2	0	2	4	4	8	NIL
5	PCC	25EE5103	ADVANCED POWER SYSTEM ANALYSIS & PROTECTION	APSAP	3	1	0	0	4	5	NIL
6	PCC	25EE5104	POWER SYSTEM STABILITY& CONTROL	PSSC	3	0	2	0	4	4	NIL
7	PCC	25EE5205	DIGITAL CONTROL SYSTEMS	DCS	3	1	0	0	4	4	NIL
8	PCC	25EE5206	SMART GRID TECHNOLOGIES	SGT	2	1	0	0	3	3	NIL
9	PE-1	25EE51A1	ELECTRIC VEHICLE POWER TRAIN DESIGN	EVPTD	2	0	2	0	3	4	NIL
10	PE-1	25EE51A2	GRID INTEGRATION OF RENEWABLE ENERGY SYSTEMS	GIEES	2	0	2	0	3	4	NIL
11	PE-2	25EE51B1	EV BATTERIES & CHARGING SYSTEM	EVBCS	2	0	2	0	3	4	NIL
12	PE-2	25EE51B2	ENERGY STORAGE SYSTEMS	ESS	2	0	2	0	3	4	NIL
13	PE-3	25EE52C1	FAULT DIAGNOSIS AND CONTROL OF ELECTRIC VEHICLE	FDCEV	3	1	0	0	4	5	NIL
14	PE-3	25EE52C2	ENERGY CONSERVATION & AUDIT	ECA	3	1	0	0	4	5	NIL
15	PE-4	25EE52D1	AI AND IOT FOR MODERN ELECTRICAL VEHICLES	AIMEV	3	0	0	0	3	3	NIL
16	PE-4	25EE52D2	AI AND IOT FOR GREEN ENERGY SYSTEMS	AIGES	3	0	0	0	3	3	NIL
17	PE-5	25EE53E1	BATTERY MANAGEMENT SYSTEMS	BMS	3	0	0	0	3	0	NIL
18	PE-5	25EE53E2	GREEN BUILDINGS AND SMART CITIES	GBSC	3	0	0	0	3	0	NIL
19	OE	25OEXXXX	OPEN ELECTIVE		3	0	0	0	3	0	NIL
20	PRI	25IE5201	ESSENTIALS OF RESEARCH DESIGN	ERD	1	1	0	0	2	2	NIL
25	PRI	25IE5149	TERM PAPER	TP	0	0	8	0	4	8	NIL
26	PRI	25IE6150	DISSERTATION	CP-1	0	0	32	0	16	24	NIL
27	PRI	25IE6250	DISSERTATION	CP-2	0	0	32	0	16	24	NIL
28	PRI	25IE6051	INTERNSHIP		0	0	32	0	16	24	NIL
29	PRI	25IE6052	INTERNSHIP		0	0	32	0	16	24	NIL
30	VAC		VALUE Added course		2	0	0	0	0	2	NIL
31	VAC		VALUE Added course		2	0	0	0	0	2	NIL

TOTAL CREDITS

Bar

2 0 0 0 0 NIL

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Y25 M.TECH (PEPS) STRUCTURE

Sl No	COUR SE CAT	COURSE CODE	COURSE TITLE	SHORT NAME	L	T	P	S	Cr	CH	PRE-REQUI SITE
1	AUC	23UC5201	PROFESSIONAL COMMUNICATION SKILLS	PCS	0	0	4	0	0	4	NIL
2	AUC	25EE5207	MATLAB PROGRAMMING FOR ENGINEERS	MATLAB	0	0	4	0	0	4	NIL
3	ESC	25EE5101	PYTHON PROGRAMMING FOR ELECTRICAL SYSTEMS	PPES	3	0	2	0	4	5	NIL
4	PCC	25EE5102	ADVANCED POWER CONVERTERS	APC	2	0	2	4	4	8	NIL
5	PCC	25EE5104	POWER SYSTEM STABILITY & CONTROL	PSSC	3	0	2	0	4	5	NIL
6	PCC	25EE5111	MODELLING AND ANALYSIS OF ELECTRICAL MACHINES	MAEM	3	1	0	0	4	4	NIL
7	PCC	25EE5212	ADVANCED ELECTRIC DRIVES	AED	3	1	0	0	4	4	NIL
8	PCC	25EE5213	DIGITAL CONTROLLERS	DC	2	1	0	0	3	3	NIL
9	PE-1	25EE51F1	OPTIMIZATION TECHNIQUES	OT	2	0	2	0	3	4	NIL
10	PE-1	25EE51F2	RELIABILITY ENGINEERING & APPLICATION TO POWER SYSTEMS	REAPS	2	0	2	0	3	4	NIL
11	PE-2	25EE51B1	EV BATTERIES & CHARGING SYSTEM	EVBCS	2	0	2	0	3	4	NIL
12	PE-2	25EE51B2	ENERGY STORAGE SYSTEMS	ESS	2	0	2	0	3	4	NIL
13	PE-3	25EE52G1	FACTS & POWER QUALITY	FACTS& PQ	3	1	0	0	4	5	NIL
14	PE-3	25EE52C2	ENERGY CONSERVATION & AUDIT	ECA	3	1	0	0	4	5	NIL
15	PE-4	25EE52H1	DIGITAL SIMULATION OF POWER ELECTRONIC SYSTEMS	DSPES	3	0	0	0	3	3	NIL
16	PE-4	25EE52H2	SWITCHED MODE POWER SUPPLY AND PWM TECHNIQUES	SMPS& PWMT	3	0	0	0	3	3	NIL
17	PE-5	25EE53E1	BATTERY MANAGEMENT SYSTEMS	BMS	3	0	0	0	3	0	NIL
18	PE-5	25EE53E2	GREEN BUILDINGS AND SMART CITIES	GBSC	3	0	0	0	3	0	NIL
19	OE	25OEXXXX	OPEN ELECTIVE		3	0	0	0	3	0	NIL
20	PRI	25IE5201	ESSENTIALS OF RESEARCH DESIGN	ERD	1	1	0	0	2	2	NIL
25	PRI	25IE5149	TERM PAPER	TP	0	0	8	0	4	8	NIL
26	PRI	25IE6150	DISSERTATION	CP-1	0	0	32	0	16	24	NIL
27	PRI	25IE6250	DISSERTATION	CP-2	0	0	32	0	16	24	NIL
28	PRI	25IE6051	INTERNSHIP		0	0	32	0	16	24	NIL
29	PRI	25IE6052	INTERNSHIP		0	0	32	0	16	24	NIL
30	VAC		VALUE Added course		2	0	0	0	0	2	NIL
31	VAC		VALUE Added course		2	0	0	0	0	2	NIL

TOTAL CREDITS

80.00

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Department of EEE

Pre PHD Courses for the Admitted batch in Academic Year 2025-2026

Category	Course Code	Course Title	Acron ym	L	T	P	S	CR	CH
MANDATORY COURSE	25RES104	RESEARCH METHODOLOGY		4	0	0	0	4	4
ELECTIVE COURSE-1	25EE201	SMART METERS AND SMART CITIES	SMSC	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE202	CHARGING STATION FOR ELECTRIC VEHICLES	CSEV	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE203	FACTs DEVICES	FACTs	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE204	REAL TIME CONTROL OF POWER SYSTEMS	RTCPS	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE205	RENEWABLE ENERGY SOURCES AND INTEGRATION	RESI	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE206	IOT FOR INDUSTRIAL AUTOMATION	IOTIA	4	0	0	0	4	4
ELECTIVE COURSE-1	25EE207	ADVANCED POWER CONVERTERS	APC	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE301	SMART GRIDS TECHNOLOGIES	SGT	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE302	BATTERY MANAGEMENT SYSTEM FOR ELECTRIC VEHICLES	BMSE V	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE303	POWER QUALITY	PQ	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE304	ADAPTIVE CONTROL SYSTEMS	ACS	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE305	DIGITAL PROTECTION OF POWER SYSTEMS	DPPS	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE306	AI TECHNIQUES IN POWER SYSTEMS	AITPS	4	0	0	0	4	4
ELECTIVE COURSE-2	25EE307	ADVANCED ELECTRICAL DRIVES	AED	4	0	0	0	4	4

Day

[Signature]
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