SHIV NADAR UNIVERSITY
CHENNAI

SSN School of Engineering

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Master of Technology

Power Electronics and Drives

CURRICULUM

REGULATIONS 2026

VISION AND MISSION OF THE DEPARTMENT

VISION

To attain global eminence in Electrical and Electronics Engineering education, research, and innovation by empowering students with technological excellence, professional integrity, entrepreneurial spirit, and social responsibility

MISSION

- To impart advanced technical knowledge and hands-on competence in emerging Electrical and Electronics Engineering domains through innovative teaching, research, and industry-integrated learning.
- To promote research, innovation, and entrepreneurship through strong academia–industry collaboration, addressing global and sustainable technological challenges.
- To develop ethically responsible, career-ready graduates with lifelong learning skills and a commitment to serve society and the global community with integrity.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- **PEO1:** Career Development: Graduates will have technical knowledge, skills and analytical ability to design, develop and test power electronic converters and drives using modern tools..
- **PEO2:** Social and ethical responsibilities: Graduates will have skills and knowledge in the field of power electronics and drives to improve the system performance and to relate social, ethical, economic and environmental dimensions.
- **PEO3:** Life-long learning: Graduates will have confidence to conduct research, take up higher studies and life-long learning in the field of power electronics and drives.

PROGRAM OUTCOMES (POs)

At the end of the programme, the graduates will achieve the following attributes:

- **PO1:** An ability to independently carry out research /investigation and development work to solve practical problems.
- **PO2:** An ability to write and present a substantial technical report/document.
- **PO3:** Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- **PO4:** To use modern simulation tools and hardware technologies for modelling and prototyping of power electronic systems addressing societal needs.

PEO / PO Mapping

PO \ PEO	PEO1	PEO2	PEO3
PO1			3
PO2		2	2
PO3	3	2	1
PO4	3	3	2

Mapping Programme Outcomes with Graduate Attributes

S.No	NBA-GA	ME PED PO
1	Scholarship of knowledge	1
2	Critical thinking	1
3	Problem solving	1
4	Research skill	2
5	Usage of modern tools	2
6	Collaborative and multidisciplinary research	2
7	Project management and finance	4
8	Communication	4
9	Life-long learning	3
10	Ethical practices and social responsibility	2
11	Independent and reflective learning	2

COURSE SUMMARY

The listed courses in the curriculum are broadly classified as per the recommendations from the UGC.

Sl. No	Broad Category of Course	Minimum Credit Requirement	Proposed Credits
1	Department Core Course (DC)	10	80
2	Major Core Course (MC)	30	32
3	Multidisciplinary Course (MD)	10	09
4	Open Elective (OE)	2	08
5	Project Dissertation (PD)	20	09
6	Research Internship (RI)	4	08
7	Skill Enhancement Course (SEC)	4	2
	Total	**80**	**80**

The semester wise credit breakup of the Curriculum based on the above credit breakup proposed by the UGC is as follows:

Semester\Category	DC	MC	MD	OE	PD	RI	SEC	TOTAL
I	7	8	4	2			2	**23**
II	3	14	3				2	**22**
III		8	3		8	4		**23**
IV					12			**12**
Total	**10**	**30**	**10**	**2**	**20**	**4**	**4**	**80**

SEMESTER I

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Applied Mathematics for Power Engineering	MD	4	60	0	0	60	120	4
2		System Design with Microcontroller	DC	5	45	0	30	45	120	4
3		FACTS and Custom Power Devices	DC	3	45	0	0	45	90	3
4		Design and Analysis of Power Converters	MC	5	45	0	30	45	120	4
5		Elective 1	MC	5	45	0	30	45	120	4
6		Research Methodology / IPR/Operations Research	OE	2	30	0	0	30	60	2
7		English for Research Paper Writing	SEC	2	0	15	30	15	60	2
TOTAL				**26**	**270**	**15**	**120**	**285**	**690**	**23**

SEMESTER II

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Elective 2	MD	3	45	0	0	45	90	3
2		Electric Vehicle Technology	DC	3	45	0	0	45	90	3
3		Solid State Drives	MC	5	45	0	30	45	120	4
4		Power Electronics for Renewable Energy Systems	MC	5	45	0	30	45	120	4
5		Elective 3	MC	3	45	0	0	45	90	3
6		Elective 4	MC	3	45	0	0	45	90	3
7		Python Programming for Machine Learning	SEC	2	0	15	30	15	60	2
TOTAL				**24**	**270**	**15**	**90**	**285**	**660**	**22**

SEMESTER III

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Multi-disciplinary Open Elective	MD	3	45	0	0	45	90	3
2		Elective 5	MC	5	45	0	30	45	120	4
3		Elective 6	MC	5	45	0	30	45	120	4
PRACTICALS										
4		Project/Dissertation Phase I	PD	16	0	0	160	80	240	8
5		Research Internship	RI		0	0	0	120	120	4
TOTAL				**29**	**135**	**0**	**220**	**335**	**690**	**23**

SEMESTER IV

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
PRACTICALS										
1		Project/Dissertation Phase II	PD	24	0	0	240	120	360	12
TOTAL				**24**	**0**	**0**	**240**	**120**	**360**	**12**

ELECTIVE 1

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		System Theory	MC	5	45	0	30	45	120	4
2		Modelling and Analysis of Electrical Machines	MC	5	45	0	30	45	120	4
3		Advanced Power Semiconductor Devices	MC	5	45	0	30	45	120	4
4		Power System Automation	MC	5	45	0	30	45	120	4

ELECTIVE 2

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Modern Rectifiers and Resonant Converters	MD	3	45	0	0	45	90	3
2		Advanced Power Converters	MD	3	45	0	0	45	90	3
3		High Power Inverters	MD	3	45	0	0	45	90	3
4		Design Techniques for SMPS	MD	3	45	0	0	45	90	3

ELECTIVE 3

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Technologies for Wind Energy Conversion	MC	3	45	0	0	45	90	3
2		Design of Solar Photovoltaic Systems	MC	3	45	0	0	45	90	3
3		Hydrogen and Fuel Cell Technology	MC	3	45	0	0	45	90	3
4		Battery Management Systems	MC	3	45	0	0	45	90	3

ELECTIVE 4

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		High Voltage Direct Current Transmission System	MC	3	45	0	0	45	90	3
2		Energy Management Auditing	MC	3	45	0	0	45	90	3
3		Restructured Power Systems	MC	3	45	0	0	45	90	3
4		Power Quality	MC	3	45	0	0	45	90	3

ELECTIVE 5

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Modelling of EV Power Train	MC	5	45	0	30	55	120	4
2		Smart Grid and Microgrid Technologies	MC	5	45	0	30	55	120	4
3		Condition Monitoring of Electrical Machines	MC	5	45	0	30	55	120	4
4		IoT for Smart Systems	MC	5	45	0	30	55	120	4

ELECTIVE 6

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Electric Vehicle Charging Systems	MC	5	45	0	30	55	120	4
2		Grid Integration of Renewable Energy Systems	MC	5	45	0	30	55	120	4
3		Machine Learning for Power Engineering	MC	5	45	0	30	55	120	4

4		Digital Controllers in Power Engineering Applications	MC	5	45	0	30	55	120	4

MULTI-DISCIPLINARY OPEN ELECTIVE

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Electric and Hybrid Vehicles	MD	3	45	0	0	45	90	3
2		Energy Auditing and Management	MD	3	45	0	0	45	90	3
3		Renewable Energy Conversion Systems	MD	3	45	0	0	45	90	3
4		Energy Storage Systems	MD	3	45	0	0	45	90	3

Note: Students from M.Tech. Power Electronics and Drives must not opt for this Open Elective.

L - Lecture, **T** - Tutorial, **P** - Practical, TW & SL – Term Work & Self Learning, TH – Total Hours and **C** – Credits