



ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2025-26

Electrical Engineering

Annexure – I

CREDIT FRAMEWORK STRUCTURE

Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	7	7							14
Engineering Science Course		6	6							12
Program Core Course (PCC)	Program Courses	2	2	13	10	7	4	6		44
Program Elective Course (PEC)						4	6	6	4	20
Multidisciplinary Minor (MDM)	Multidisciplinary Courses			2	3	3	3	3		14
Open Elective (OE) Other than a particular program						2	3	3		08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	2		1	1	2	2			08
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	1	1			2				04
Entrepreneurship/Economics/Management Courses				2	2					04
Indian Knowledge System (IKS)				2						02
Value Education Course (VEC)				2	2					04
Research Methodology	Experiential Learning Courses								4	04
Comm. Engg. Project (CEP)/ Field Project (FP)					2					02
Project							2	2		04
Internship/OJT									12	12
Co-curricular Courses (CC)	Liberal Learning Courses	2	2							04
Total Credits (Major)		20	160							

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SEMESTER I (Group 2)

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	BSC	25EE101T	Applied Physics	2	-	-	2	10	10	30	50	23	1.5
2	BSC	25EE101P	Applied Physics Lab	-	-	2	1	-	25	25	50	25	-
3	BSC	25EE102T	Linear Algebra and Calculus	3		-	3	20	20	60	100	45	3
4	BSC	25EE102P	Linear Algebra and Calculus Lab			2	1	-	25	25	50	25	-
5	ESC	25EE103T	Basic Electrical Engineering	3	-	-	3	20	20	60	100	45	3
6	ESC	25EE103P	Basic Electrical Engineering Lab	-	-	2	1	-	25	25	50	25	-
7	ESC	25EE104T	Engineering Graphics	3	-	-	3	20	20	60	100	45	3
8	ESC	5EE104P	Engineering Graphics Lab	-	-	2	1	-	25	25	50	25	-
9	AEC	25EE105P	Business Communication Skills I Lab	-	-	2	1	-	25	25	50	25	-
10	SEC	25EE106T	Design Thinking #	2	-	-	2	10	10	30	50	23	1.5
11	CC	25EE107T	Co-curricular Courses - I	2			2	-	50	-	50	23	-
Total				15	-	10	20	80	255	365	700		

Course to be taken online through NPTEL

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SEMESTER II (Group 2)

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	BSC	25EE201T	Engineering Chemistry	2	-	-	2	10	10	30	50	23	1.5
2	BSC	25EE201P	Engineering Chemistry Lab	-	-	2	1	-	25	25	50	25	-
3	BSC	25EE202T	Statistics and Transforms	3	-	-	3	20	20	60	100	45	3
4	BSC	25EE202T	Statistics and Transforms Lab	-	-	2	1	-	25	25	50	25	-
5	PCC	25E203T	Electrical Measurement & Instrumentation	3	-	-	3	20	20	60	100	45	3
6	PCC	25EE203P	Electrical Measurement & Instrumentation Lab	-	-	2	1	-	25	25	50	25	-
7	ESC	25EE204T	Basic Electronics Circuits	3	-	-	3	20	20	60	100	45	3
8	ESC	25EE204P	Basic Electronics Circuits Lab	-	-	2	1	-	25	25	50	25	-
9	AEC	25EE205P	Business Communication Skills II Lab	-	-	2	1	-	25	25	50	25	-
10	IKS	25EE206T	Indian Knowledge Systems#	2	-	-	2	10	10	30	50	23	1.5
11	CC	25EE207T	Co-curricular Courses – II	2			2	-	50	-	50	23	-
Total				15	-	10	20	80	255	365	700		

Course to be taken online through NPTEL

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SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	PCC	25EE301T	Network Analysis	3	-	-	3	20	20	60	100	45	3
2	PCC	25EE 302T	Electrical Machines-1	3	-	-	3	20	20	60	100	45	3
3	PCC	25EE302P	Electrical Machines-1Lab	-	-	2	1	-	25	25	50	25	-
4	PCC	25EE303T	Elements of Electromagnetics	3	-	-	3	20	20	60	100	45	3
5	PCC	25EE304T	Renewable Energy Sources	2	-	-	2	10	10	30	50	23	1.5
6	PCC	25EE304P	Renewable Energy Sources Lab	-	-	2	1	-	25	25	50	25	-
7	VEC	25ES401T	Environmental Science	2	-	-	2	10	10	30	50	23	1.5
8	HSSM	25ES402T	Fundamentals of Economics and Management	2	-	-	2	10	10	30	50	23	1.5
9	SEC	25EE341P	Career Development I	-	-	2	1		50	-	50	25	-
10	MDM	25EE331M	MDM-I (Refer MDM basket)	2	-	-	2	10	10	30	50	23	1.5
Total				17		6	20	100	200	350	650		

Note: Any one PCC to be taken through NPTEL. The course will be notified one month prior to commencement of semester.

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SEMESTER IV

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of Hrs. for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	PCC	25EE401T	Electrical Power System	3	-	-	3	20	20	60	100	45	3
2	PCC	25EE402T	Computer Programming	2	-	-	2	10	10	30	50	25	1.5
3	PCC	25EE402P	Computer Programming Lab	-	-	2	1	-	25	25	50	25	-
4	PCC	25EE404T	Electrical Machines-II	3	-	-	3	20	20	60	100	45	3
5	PCC	25EE404P	Electrical Machines- II Lab	-	-	2	1	-	25	25	50	25	-
6	CEP	25EE403P	Mini Project*	-	-	4	2	-	50	-	50	25	-
7	VEC	25ES301T	Constitution of India	2	-	-	2	10	10	30	50	23	1.5
9	HSSM	25ES302T	Fundamentals of Entrepreneurship	2	-	-	2	10	10	30	50	23	1.5
10	SEC	25EE441P	Career Development - II	-	-	2	1	-	50	-	50	25	-
11	MDM	25EE431M	MDM-II (Refer MDM basket)	3	-	-	3	20	20	60	100	45	3
Total				15	-	10	20	90	240	320	650		

Note: Any one PCC to be taken through NPTEL. The course will be notified one month prior to commencement of semester.

* Field Project or Community engagement project in the major discipline

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SEMESTER V

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of HRS for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	PCC	25EE501T	Power Electronics	3	-	-	3	20	20	60	100	45	3
2	PCC	25EE501P	Power Electronics Lab	-	-	2	1	-	25	25	50	25	-
3	PCC	25EE502P	Electrical Engineering Drawing Lab	-	-	2	1	-	25	25	50	25	-
4	PCC	25EE503T	Electrical Machine Design	3	-	-	3	20	20	60	100	45	3
5	VSC	25EE504P	Technical Skill Development - I	-	-	4	2	-	50	-	50	25	-
7	PEC	25EE505T	Professional Elective-I (Refer PE-I Basket)	3	-	-	3	20	20	60	100	45	3
8	AEC	25EE541P	English for Engineers	-	-	4	2	-	50	-	50	25	-
9	MDM	25EE531M	MDM – III (Refer MDM basket)	3	-	-	3	20	20	60	100	45	3
10	OE	25EE561O	Open Elective – I (Refer OE basket)	2	-	-	2	10	10	30	50	23	1.5
Total				14	-	12	20	90	240	320	650		

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SEMESTER VI

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of HRS for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	PCC	25EE601T	High Voltage Engineering	2	-	-	2	10	10	30	50	25	1.5
2	PCC	25EE601P	High Voltage Engineering Lab	-	-	2	1	-	25	25	50	25	-
3	PCC	25EE602T	Control System Engineering	3	-	-	3	20	20	60	100	45	3
4	PCC	25EE602P	Control System Engineering Lab	-	-	2	1	-	25	25	50	25	-
5	PEC	25EE603T	Professional Elective – II (Refer PE-II Basket)	2	-	-	2	10	10	30	50	23	1.5
6	PCC	25EE605P	Electrical Engineering Workshop	-	-	2	1	-	50	-	50	25	-
7	PROJ	25EE604P	Project - I	-	-	4	2	-	50	-	50	25	-
8	VSC	25EE606P	Technical Skill Development -II	-	-	4	2	-	50	-	50	25	-
9	MDM	25EE631M	MDM – IV (Refer MDM basket)	3	-	-	3	20	20	60	100	45	3
10	OE	25EE661O	Open Elective – II (Refer OE basket)	3	-	-	3	20	20	60	100	45	3
			Total	13	-	14	20	80	280	290	650		

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SEMESTER VII

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of HRS for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	PCC	25EE701T	Switchgear & Protection	3	-	-	3	20	20	60	100	45	3
2	PCC	25EE701P	Switchgear & Protection Lab	-	-	2	1	-	25	25	50	25	-
3	PCC	25EE702P	Power System Simulation Lab	-	-	2	1	-	25	25	50	25	-
4	PEC	25EE703T	Professional Elective – III (Refer PE-III Basket)	3	-	-	3	20	20	60	100	45	3
5	PEC	25EE704T	Professional Elective – IV (Refer PE-IV Basket)	3	-	-	3	20	20	60	100	45	3
6	ELC	25EE705P	Project - II	-	-	4	2	-	50	50	100	50	-
7	PCC	25EE706P	Technical Aptitude			2	1	-	50	-	50	25	
8	MDM	25EE731M	Multi Disciplinary Minor-V (Refer MDM Basket)	3	-	-	3	20	20	60	100	45	3
9	OE	25EE761O	Open Elective- III	3	-	-	3	20	20	60	100	45	3
Total				15	0	10	20	100	250	400	750		

Note: Any one PCC /PEC to be taken through NPTEL. The course will be notified one month prior to commencement of semester.

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SEMESTER VIII

Option A

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Mid-Sem Examination	Maximum Marks			Min passing Marks	No of Hours for ESE
				L	T	P			Continual Assessment	End Sem Examination	Total		
1	RM	25ES801T	Research Methodology#	2	-	-	2	10	10	30	50	23	1.5
2	RM	25ES801P	Research Methodology Lab#			4	2	-	-	50	50	25	
3	PEC	25EE801T	Professional Elective- V#	3	-	-	3	20	20	60	100	45	3
4	PEC	25EE801P	Professional Elective- V Lab#			2	1	-	-	50	50	25	
5	OJT	25EE802P(i)	Industry/Research Internship*	-	-	24	12	-	300	100	400	200	-
Total				5	0	30	20			290	650		

Courses to be mapped with NPTEL/SWAYAM/MOOC offered course in that semester. Exam will be conducted by NPTEL/Institute

* One semester internship in any industry is to be carried.

\$ Two NPTEL courses (as per choice of student) or Institutional Internship by IEDC, SVP CET.

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SEMESTER VIII

Option B

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min passing Marks	No of Hours for ESE
				L	T	P		Continual Assessment	Mid-Sem Examination	End Sem Examination	Total		
1	RM	25ES801T	Research Methodology#	2	-	-	2	10	10	30	50	23	1.5
2	RM	25ES801P	Research Methodology Lab#			4	2	-	-	50	50	25	
3	PEC	25EE801T	Professional Elective-V#	3	-	-	3	20	20	60	100	45	4
4	PEC	25EE801P	Professional Elective-V Lab#			2	1	-	-	50	50	25	
5	OJT	25EE802P(i)	IndInternship*	-	-	25	12	300	-	100	400	200	-
Total				5	0	31	20	360		290	650		

Option B is available to students only after recommendation of the concerned Head of the department. The project and internship should contribute towards career development plan of the students.

Courses to be mapped with NPTEL/SWAYAM/MOOC offered course in that semester. Exam will be conducted by NPTEL/Institute

*** One semester internship in any industry is to be carried.**

§ Two NPTEL courses (as per choice of student) or Institutional Internship by IEDC, SVP CET.

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Basket for Multi-Disciplinary Minor Courses (MDM)

A. Electrical Engineering

Semester	Course Category	Course Code	Name of Course
III	MDM-I	25EE331M	Basic Electrical Machines
IV	MDM-II	25EE431M	Power Electronics
V	MDM-III	25EE531M	Electrical Power System
VI	MDM-IV	25EE631M	Electric Drives
VII	MDM-V	25EE731M	Control System Engineering

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Basket for Program Elective Courses (PEC)

	Professional Elective - I
25EE505T(i)	PLC & Industrial Automation
25EE505T(ii)	Linear Electronics Circuit
25EE505T(iii)	Signals & Systems
25EE505T(iv)	Power Station Practice
25EE505T(v)	Electric Vehicle Architecture

	Professional Elective-II
25EE603T(i)	Micro-controller Application in Electrical Engineering
25EE603T(ii)	Computer Applications in Power System
25EE603T(iii)	Electric Drives
25EE603T(iv)	Advanced Power System
25EE603T(v)	Monitoring & Testing of Electrical Machines

	Professional Elective - III
25EE703T(i)	Energy Management and Audit
25EE703T(ii)	Electrical Installation and Design
25EE703T(iii)	Power Quality
25EE703T(iv)	Battery Management Systems
25EE703T(v)	Electrical Instrumentation
25EE703T(vi)	Solar PV Systems

	Professional Elective-IV
25EE704T(i)	Power Semiconductor based Drives
25EE704T(ii)	Flexible AC Transmission Systems
25EE704T(iii)	Advanced Control System
25EE704T(iv)	Vehicle Dynamics
25EE704T(v)	Electrical Distribution System
25EE704T(vi)	HVDC Transmission system

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Open Elective - I

Open Elective - I	
25EE561O(i)	Power Plant Engineering
25EE561O (ii)	PLC & SCADA Systems

Open Elective - II

Open Elective - II	
25EE661O (i)	MATLAB Programming
25EE661O (ii)	Utilization of Electrical Energy

Open Elective - III

Open Elective - III	
25EE761O (i)	Electric Vehicle
25EE761O (ii)	Monitoring & Testing of Electrical Machines

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EXIT OPTIONS

Award of UG Certificate in Major with 40 credits and an additional 8 credits to be earned out of following courses (After First Year)

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1.	Basic electrical circuits	NPTEL Online courses	3
2.	Electrical Measurement and Electronic Instruments	NPTEL Online courses	3
3.	Network Analysis	NPTEL Online courses	3
4.	Power System Engineering	NPTEL Online courses	3
5.	Electrical Machines - I	NPTEL Online courses	3
6.	Electrical Machines	NPTEL Online courses	3
7.	Power system analysis	NPTEL Online courses	3
8.	A Basic Course on Electric and Magnetic Circuits	NPTEL Online courses	3

Award of UG Diploma in Major with 80 credits and an additional 8 credits to be earned out of following courses (After Second Year)

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1.	Power Electronics	NPTEL Online courses	3
2.	Control engineering	NPTEL Online courses	3
3.	Power System Protection	NPTEL Online courses	3
4.	Fundamental of Power Electronics	NPTEL Online courses	3
5.	Fundamentals of Electric Drives	NPTEL Online courses	3
6.	Power System Protection and Switchgear	NPTEL Online courses	3
7.	Sustainable Power Generation Systems	NPTEL Online courses	3
8.	DC Power Transmission Systems	NPTEL Online courses	3

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Award of UG Degree in Major with 120 credits and an additional 8 credits to be earned out of following courses (After Third Year)

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1.	Computer Aided Power System Analysis	NPTEL Online courses	3
2.	Digital Protection of Power System	NPTEL Online courses	3
3.	Modeling, Analysis and Estimation of Three Phase Unbalanced Power Network	NPTEL Online courses	3
4.	Smart Grid: Basics to Advanced Technologies	NPTEL Online courses	3
5.	Power Quality	NPTEL Online courses	3
6.	Operation and Planning of Power Distribution Systems	NPTEL Online courses	3
7.	Advance Power Electronics	NPTEL Online courses	3
8.	Design Of Electric Motors	NPTEL Online courses	3

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