JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech. in ELECTRICAL AND ELECTRONICS ENGINEERING
COURSE STRUCTURE & SYLLABUS (R25 Regulations)
Applicable from AY 2025-26 Batch

I Year I Semester (25 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC	Matrices and Calculus	3	1	0	4
2	BSC	Physics	3	0	0	3
3	CSC	C Programming	3	0	0	3
4	MEC	Computer Aided Engineering Graphics	2	0	2	3
5	ESC	Electrical Circuits - I	2	0	0	2
6	HSC	English for Skill Enhancement	3	0	0	3
7	BSC	Physics Laboratory	0	0	2	1
8	CSC	C Programming Laboratory	0	0	2	1
9	HSC	English Language and Communication Skills Laboratory	0	0	2	1
10		Induction Program				
		Total Credits	**16**	**01**	**08**	**21**

I Year II Semester (25 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC	Ordinary Differential Equations and Vector Calculus	3	0	0	3
2	BSC	Engineering Chemistry	3	0	0	3
3	CSC	Python Programming	3	0	0	3
4	ESC	Data Structures	3	0	0	3
5	Dept. Core	Electrical Circuits - II	3	0	0	3
6	MEC	Engineering Workshop	0	0	2	1
7	BSC	Engineering Chemistry Laboratory	0	0	2	1
8	CSC	Python Programming Laboratory	0	0	2	1
9	ESC	Data Structures Lab	0	0	2	1
10	ESC	Electrical Circuits Laboratory	0	0	2	1
		Total Credits	**15**	**0**	**10**	**20**

II YEAR I SEMESTER (25 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	Dept. Core	Electromagnetic fields	3	0	0	3
2	Dept. Core	Electrical Machines - I	3	0	0	3
3	Dept. Core	Electronic Devices and Circuits	3	0	0	3
4	Dept. Core	Power Systems - I	3	0	0	3
5	Dept. Core	Electrical Measurements and Sensors	2	0	0	2
6		Innovation and Entrepreneurship	2	0	0	2
7	Dept. Core Laboratory	Electrical Machines - I Laboratory	0	0	2	1
8	Dept. Core Laboratory	Electrical Measurements and Sensors Laboratory	0	0	2	1
9	Dept. Core Laboratory	Electronic Devices and Circuits Laboratory	0	0	2	1

10	(Skill Development Course – 1)	Design of Electrical Systems using AutoCAD	0	0	2	1
11	MC	Environmental Science	1	0	0	1
		Total Credits	**17**	**0**	**08**	**21**

II YEAR II SEMESTER (25 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC	Numerical Methods and Complex Variables	3	0	0	3
2	Dept. Core	Electrical Machines - II	3	0	0	3
3	Dept. Core	Power Systems - II	3	0	0	3
4	Dept. Core	Digital Electronics	3	0	0	3
5	Dept. Core	Control Systems	3	0	0	3
6		Computational Mathematics Laboratory	0	0	2	1
7	Dept. Core Laboratory	Electrical Machines - II Laboratory	0	0	2	1
8	Dept. Core Laboratory	Control Systems Laboratory	0	0	2	1
9	Dept. Core Laboratory	Digital Electronics Laboratory	0	0	2	1
10	(Skill Development Course – 2)	PCB Design	0	0	2	1
		Total Credits	**15**	**0**	**10**	**20**

III YEAR I SEMESTER (27 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	Dept. Core	Power Electronics	3	0	0	3
2	Dept. Core	Microprocessors and Microcontrollers	3	0	0	3
3	Dept. Core	Power System Protection	3	0	0	3
4		Professional Elective-I	3	0	0	3
5		Open Elective-I	2	0	0	2
6	Dept. Core Laboratory	Power Electronics Laboratory	0	0	2	1
7	Dept. Core Laboratory	Power System Laboratory	0	0	2	1
8	Dept. Core Laboratory	Microprocessors and Microcontrollers Laboratory	0	0	2	1
9		Field-Based Project/Internship	0	0	4	2
10	(Skill Development Course – 3)	Robotics and Automation	0	0	2	1
11	MC	Indian Knowledge System	1	0	0	1
		Total Credits	**15**	**0**	**12**	**21**

III YEAR II SEMESTER (25 Hours)

S.No	Course Code	Course Title	L	T	P	Credits
1	Dept. Core	Power System Operation and Control	3	0	0	3

2	Dept. Core	Signals and Systems	3	0	0	3
3		Fundamentals of Management/ Business Economics and Financial Analysis/ Organisational Behaviour	3	0	0	3
4		Professional Elective-II	3	0	0	3
5		Open Elective – II	2	0	0	2
6	Dept. Core Laboratory	Signals and Systems Laboratory	0	0	2	1
7	Dept. Core Laboratory	Power System Simulation Laboratory	0	0	2	1
8	Dept. Core Laboratory	Electrical and Electronics Design Laboratory	0	0	2	1
9	HSC	English for Employability Skills Laboratory	0	0	2	1
10	(Skill Development Course – 4)	Design of Solar Power System	0	0	2	1
11	MC	Gender Sensitization Lab*/ Human Values and Professional Ethics*	1	0	0	1
		Total Credits	**15**	**0**	**10**	**20**

***Note: For the courses Gender Sensitization Lab and Human Values and Professional Ethics -** one hour of instruction will be conducted on alternate weeks. For example, if a one-hour class for Gender Sensitization Lab is conducted this week, then a one-hour class for Constitution of India will be conducted in the following week.

IV YEAR I SEMESTER (25 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1	Dept. Core	Power Electronics for Renewable Energy Systems	3	0	0	3
2	Dept. Core	Hybrid Electric Vehicles	3	0	0	3
3		Fundamentals of Management/ Business Economics and Financial Analysis/ Organisational Behaviour	3	0	0	3
4		Professional Elective - III	3	0	0	3
5		Professional Elective – IV	3	0	0	3
6		Open Elective – III	2	0	0	2
7	Dept. Core Laboratory	Power Electronics for Renewable Energy Systems Laboratory	0	0	2	1
8	Dept. Core Laboratory	Electric Vehicles Laboratory	0	0	2	1
9		Industry Oriented Mini Project/ Summer Internship	0	0	4	2
		Total Credits	**17**	**0**	**08**	**21**

IV YEAR II SEMESTER (34 Hours)

S. No.	Course Code	Course Title	L	T	P	Credits
1		Professional Elective – V	3	0	0	3
2		Professional Elective – VI	3	0	0	3
3		Project Work	0	0	28	14
		Total Credits	**06**	**0**	**28**	**20**

***Note:** Students who wish to exit after II Year II Semester has to register for this optional course and acquire the credits allotted by doing 6 weeks Work-based Vocational Course/ Internship or Apprenticeship. Please refer R25 Academic Regulations for more information.

Professional Elective - I

1	Utilization of Electrical Energy
2	Renewable Energy Systems
3	VLSI Design

Professional Elective - II

1	Power Semiconductor Drives
2	High Voltage Engineering
3	Programmable Logic Controllers

Professional Elective-III

1	Energy Storage Systems
2	Power Quality
3	Digital Signal Processing

Professional Elective-IV

1	Battery Management Systems
2	Smart Grid Technologies
3	AI and ML for Electrical Engineering Applications

Professional Elective-V

1	EV Charging Infrastructure
2	HVDC Transmission
3	Embedded Systems

Professional Elective-VI

1	Electrical Distribution and Automation
2	Smart Metering and Communication Protocols
3	Energy Conservation and Audit

OPEN ELECTIVES

Open Elective-I:

1	Fundamentals of Electric Vehicles
2	Industrial Automation and Control

Open Elective-II:

1	Digital Energy
2	Energy Audit

Open Elective-III:

1	Sustainable Energy
2	Smart Grid Systems