COURSE STRUCTURE AND SYLLABUS FOR B.TECH DEGREE IN ELECTRICAL ENGINEERING (MAJOR IN E-VEHICLE)

2025 Batch Onwards

RAJIV GANDHI INSTITUTE OF PETROLEUM TECHNOLOGY JAIS, AMETHI

(RGIPT JAIS, AMETHI)

Credit Distribution for B.Tech-EV 2025 Batch Onwards

Category	Range	Proposed
Humanities and Social Science (HU)	22	23
Science (IS)	70-90	80
Institute Engineering (IE)	40-70	56
Engineering Drawing, Workshop (EP)	18-24	15
Language & Management (LM)	18-24	20
Departmental Core (DC)	145-190	178
Departmental Elective (DE)	30-75	36
Open Elective (OE)	15-20	18
Project/Industrial Visit (DP)	20-50	50
Total Credits	**440-490**	**476**

Course Structure

(B. Tech. in Electrical Engineering: Major in E-Vehicle)

2025 Batch Onwards

First Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
PY111	Classical Physics (IS)	3	1	0	11
CY121	Inorganic & Physical Chemistry (IS)	3	1	0	11
MA111	Real Analysis & Calculus (IS)	3	1	0	11
ECE102	Fundamentals of Electronics Engineering (IE)	3	1	0	11
EEV101	Electrical Engineering Work Practices (EP)	1	0	2	5
ME131	Workshop Practices (EP)	0	0	3	3
ECE102L	Fundamentals of Electronics Engineering Lab (IE)	0	0	2	2
PY111L	Physics Lab (IS)	0	0	2/2	1
CY111L	Chemistry Lab (IS)	0	0	2/2	1
	Total Credits				**56**
LM101	Basic English* (L)	1	2	0	7

*Basic English course to be taken by a student on a recommendation after Diagnostic Test.

First Year Even Semester

Course Code	Course/Subject	L	T	P	Cr
PY121	Modern Physics (IS)	2	1	0	8
MA121	Differential Equations (IS)	3	1	0	11
CS101	Computer Programming (IE)	3	1	0	11
CS101L	Computer Programming Lab (IE)	0	0	2	2
CH161	Engineering Thermodynamics (IE)	3	1	0	11
EEV103	Electrical Circuits -I (IE)	3	1	0	11
ME121	Engineering Graphics (EP)	0	0	3	3
PY121L	Physics Lab (IS)	0	0	2/2	1
CY121L	Chemistry Lab (IS)	0	0	2/2	1
	Total Credits				**59**
HU102	Community Internship	1	1	0	5

Summer Term

Course/Subject	L	T	P	Cr
Industrial Training/Summer Project (DP)*	0	0	0	2

* 2-4 Weeks

Second Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
MA211	Linear Algebra and Complex Analysis (IS)	2	1	0	8
ECE213	Electromagnetic Fields Theory (DC)	3	0	0	9
EEV221	Fundamentals of Power Electronics (DC)	3	0	0	9
ECE221	Digital Circuits and Systems (DC)	3	1	0	11
EEV203	Electrical Circuits – II (DC)	3	1	0	11
EEV202	Electrical Measurements (DC)	3	0	0	9
EEV201	Circuit Design and Simulation Lab (EP)	0	0	2	2
EEV221L	Fundamentals of Power Electronics Lab (DC)	0	0	2	2
	Total Credits				**61**

Second Year Even Semester

Course Code	Course/Subject	L	T	P	Cr
MA231	Statistical Methods and Data Analysis (IS)	2	1	0	8
ECE232	Analog Circuits and Systems (DC)	3	1	0	11
EEV231	Linear Control Systems (DC)	3	1	0	11
EEV211	Electrical Machine – I (DC)	3	1	0	11
ECE211	Signals and Systems (DC)	3	1	0	11
PC101	Professional Communications (L)	2	1	0	8
EEV211L	Electrical Machine – I Lab (DC)	0	0	2/2	1
EEV231L	Control Systems Lab (DC)	0	0	2/2	1
	Total Credits				**62**

Summer Term

Course/Subject	L	T	P	Cr
Industrial Training/Summer Project (DP)*	0	0	0	3

* 4-6 Weeks

Third Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
EEV351	Fundamentals of Electric Vehicles (DC)	3	0	0	9
EEV311	Electrical Machine – II (DC)	3	0	0	9
EEV321	Static Power Converters and Applications (DC)	3	0	0	9
EEV332	Modern Control Systems (DC)	3	0	0	9
ECE323	Instrumentation Systems (DC)	3	0	0	9
	Department Elective – 1 (DE)	3	0	0	9
EEV311L	Electrical Machines – II Lab (DC)	0	0	2	2
ECE323L	Instrumentation Systems Lab (DC)	0	0	2	2
EEV321L	Static Power Converters and Applications (DC)	0	0	2	2
	Total Credits				**60**

Departmental Elective – 1 (DE – 1)	
ECE326	Embedded Systems and IOT
EEV352	Architecture of Electric and Hybrid Vehicles
EEV323	Modelling and Control of Power Converters
ECE312	Digital Signal Processing
ECE328	Linear Integrated Circuits Design
EEV331	Sensors Actuators and Control for Electric Vehicles

Third Year Even Semester

Course Code	Course/Subject	L	T	P	Cr
MA141	Numerical Methods (IS)	2	1	0	8
EEV341	Power Systems - I (DC)	3	0	0	9
EEV312	Electric Drives (DC)	3	0	0	9
	Departmental Elective – 2 (DE)	3	0	0	9
EEV312L	Electric Drives Lab (DC)	0	0	2	2
EEV351L	Electric Vehicle Lab (DC)	0	0	2/2	1

	Open Elective - 1 (OE)	3	0	0	9
MT5405	Foundations of Management (M)	2	0	0	6
HU331	Organizational Psychology (HU)	2	0	0	6
	Total Credits				**59**

Departmental Elective – 2 (DE – 2)	
EEV301	Vehicular Communication Systems and Networks
EEV353	Modelling and Simulation of Electric Vehicles
EEV354	Plug-In Electric Vehicle in Smart Grid
EEV356	Embedded System (ECU) for E-Vehicles
EEV357	Intelligent Transport System
EEV324	Control Techniques in Power Electronics
EEV333	Digital Control
ECE319	Video and Image Processing
CH451	Electrochemical Process and Energy Systems

Summer Term

Course/Subject	**L**	**T**	**P**	**Cr**
Industrial Training/Summer Project (DP)*	0	0	0	5

* 6-8 Weeks

Fourth Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
EEV443	Power Systems – II (DC)	3	0	0	9
	Department Elective – 3 (DE)	3	0	0	9
	Department Elective – 4 (DE)	3	0	0	9
	Open Elective – 2 (OE)	3	0	0	9
	Leadership and People Management (M)	2	0	0	6
	Ethics and Corporate Governance (HU)	2	0	0	6
	Employability Skills and Industry Readiness (EP)	0	0	2	2
HU313	Sociology of Industry & Work Culture (HU)	2	0	0	6
	Total Credits				**56**

Departmental Elective – 3 (DE – 3)	
EE522	Plug-In Electric Vehicles in Smart Grid
EE532	IoT in E-Vehicle Applications
EEV451	EV Batteries and Battery Management System
ME532	Automotive Safety
EE531	Modelling and Control of Power Electronics Converters and Drives
EEV412	Electrical Machine Design
EEV442	Power Quality
EEV441	Power System Protection and Switchgear
EEV431	Nonlinear Dynamical Systems

Departmental Elective – 4 (DE – 4)	
EE541	Electrical Architecture of Electric and Hybrid Vehicles
EEV455	Standards, Testing and Certification of Electric & Hybrid Vehicles
EEV456	Vehicle Safety Systems
EEV457	EV Charging Technology
EV502	Hydrogen and Fuel Cell Technology for Electric and Hybrid Vehicles
EEV444	Modelling and Simulation of Power System
EEV445	Smart Grid Technology
EV562	Autonomous and Connected Vehicles
EEV446	Distributed Energy Resources
EEV432	Optimal and Adaptive Control

Fourth Year Even Semester

Course Code	Course/Subject	L	T	P	Cr
EEV420	B.Tech. Project (Internal/External) (DP)	0	0	0	40
	Total Credits				**40**