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

2023 Batch

RAJIV GANDHI INSTITUTE OF PETROLEUM TECHNOLOGY JAIS, AMETHI

(RGIPT JAIS, AMETHI)

Credit Distribution for B. Tech-EV 2023 Batch

Category	Range	Proposed
Humanities and Social Science (HU)	22	22
Science (IS)	70-90	88
Institute Engineering (IE)	40-70	46
Engineering Drawing, Workshop (EP)	18-24	15
Language & Management (LM)	18-24	20
Departmental Core (DC)	145-190	173
Departmental Elective (DE)	30-75	36
Open Elective (OE)	15-20	18
Project/Industrial Visit (DP)	20-50	45
Total Credits	**440-490**	**463**

Course Structure

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

2023 Batch

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
BY101	Biology (IS)	2	1	0	8
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				**59**
LM101	Basic English* (L)	1	2	0	7
HU101	Universal Human Values (HU)	1	1	0	5

*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
EEV101	Electrical Engineering Work Practices (EP)	1	0	2	5
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				**53**
HU102	Community Internship	1	1	0	5

Second Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
MA211	Linear Algebra and Complex Analysis (IS)	2	1	0	8
EEV103	Electrical Circuits and Measurements (DC)	3	1	0	11
ECE201	Network Analysis and Synthesis (DC)	3	1	0	11
ECE221	Digital Circuits and Systems (DC)	3	1	0	11
ECE211	Signals and Systems (DC)	3	1	0	11
CH213	Material Engineering and Device Fabrication Practices (IE)	3	0	0	9
EEV201	Circuit Design and Simulation Lab (DC)	0	0	2	2
	Total Credits				**63**

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	Control Systems (DC)	3	0	0	9
EEV211	Electrical Machine – I (DC)	3	1	0	11
EEV221	Fundamentals of Power Electronics (DC)	3	0	0	9
PC101	Professional Communications (L)	2	1	0	8
EEV201L	Measurements and Transformer Lab (DC)	0	0	2	2
EEV221L	Fundamentals of Power Electronics Lab (DC)	0	0	2	2
	Group Discussion (EP)	0	0	2	2
	Total Credits				**62**

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
ECE313	Electromagnetic Fields Theory (DC)	3	1	0	11
EEV321	Static Power Converters and Applications (DC)	3	0	0	9
ECE323	Instrumentation and Measurements (DC)	3	0	0	9
	Department Elective – 1 (DE)	3	0	0	9
EEV311L	Electrical Machines Lab (DC)	0	0	2	2
ECE323L	Instrumentation and Measurements Lab (DC)	0	0	2	2
EEV321L	Static Power Converters and Applications (DC)	0	0	2	2
	Total Credits				**62**

Departmental Elective – 1 (DE – 1)	
ECE325	Embedded Systems
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
EEV332	Modern Control Systems

Third Year Even Semester

Course Code	Course/Subject	L	T	P	Cr
EEV312	Electric Drives (DC)	3	0	0	9
EEV341	Power Systems – I (DC)	3	0	0	9
EEV443	Power Systems – II (DC)	3	0	0	9
MA221	Numerical Methods (IS)	2	1	0	8
	Department Elective – 2 (DE)	3	0	0	9
	Department Elective – 3 (DE)	3	0	0	9
EEV312L	Electric Drives Lab (DC)	0	0	2	2
EEV351L	Electric Vehicle Lab (DC)	0	0	2/2	1
	Total Credits				**56**

Departmental Elective – 2 (DE – 2) and (DE – 3)	
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
EEV333	Digital Control
EEV332	Modern Control Systems
ECE319	Video and Image Processing
CH451	Electrochemical Process and Energy Systems
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
EEV358	Flexible AC Transmission System
EEV324	Control Techniques in Power Electronics

EEV441	Power System Protection and Switchgear
EEV431	Nonlinear Dynamical Systems
ECE341	Biomedical Signal Processing
EEV359	Modelling of Electrical Machines
EEV360	Dynamic Analysis of Electrical Machines
EEV432	Optimal and Adaptive Control
EEV445	Smart Grid Technology

Summer Term

Course/Subject	L	T	P	Cr
Industrial Training/Summer Project (DP) (6 Weeks)	0	0	12	5

Fourth Year Odd Semester

Course Code	Course/Subject	L	T	P	Cr
	Department Elective – 4 (DE)	3	0	0	9
MT5405	Foundations of Management (M)	2	0	0	6
HU331	Organizational Psychology (HU)	2	0	0	6
HU313	Sociology of Industry & Work Culture (HU)	2	0	0	6
	Leadership and People Management (M)	2	0	0	6
	Ethics and Corporate Governance (HU)	2	0	0	6
	Open Elective - 1 (OE)	3	0	0	9
	Open Elective – 2 (OE)	3	0	0	9
	Employability Skills and Industry Readiness (EP)	0	0	2	2
	Total Credits				**59**

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
EEV451	EV Batteries and Battery Management System
EE522	Plug-In Electric Vehicles in Smart Grid
EEV446	Distributed Energy Resources
ME532	Automotive Safety
EE531	Modelling and Control of Power Electronics Converters and Drives
EE532	IoT in E-Vehicle Applications
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	40	40
	Total Credits				**40**