Vidyayāmruthamashnuthe

B.N.M. Institute of Technology

An Autonomous Institution under VTU

Department of Electrical & Electronics Engineering

Autonomous 2024 Scheme & Syllabus

B.N.M Institute of Technology

An Autonomous Institution Under VTU

Department of Electrical and Electronics Engineering

Proposed 2024 Scheme for Autonomous Program

Summary of Semester wise Credits

Sl. No.	Semester	Credits
1	1	20
2	2	20
3	3	22
4	4	20
5	5	22
6	6	23
7	7	16
8	8	17
Total		**160**

Semester: III EEE

Sl. No.	Course and Course Code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical	Project	Total Hours		CIA	SEA	Total
					L	T	P	J					
1	BSC	24MAE131	Fourier Series, Transforms and Statistical Techniques	Mathematics	2	2	--	--	4	**3**	50	50	100
2	PCC	24EEE132	Generation, Transmission and Distribution	EEE	2	2	--	--	4	**3**	50	50	100
3	PCC	24EEE133	Network Analysis	EEE	2	2	--	--	4	**3**	50	50	100
4	PCI	24EEE134	Transformers and Induction Motors	EEE	3	--	2	--	5	**4**	50	50	100
5	PCI	24EEE135	Analog and Digital Electronics	EEE	3	--	2	--	5	**4**	50	50	100
6	PBL	24EEE136	Data Structures Using C	EEE	--	2	1	1	4	**2**	50	50	100
7	HSS	24CIP137	Constitution of India and Professional Ethics	HSS	1	--	--	--	1	**1**	100	--	100
8	AEC	24SFT138	Soft Skills -1	T & P	--	2	--	--	2	**1**	100	--	100
9	IPL	24EEE139	Innovative Project Lab (Social Concern)	EEE	--	--	--	2	2	**1**	100	--	100
			Total		13	10	5	3	31	**22**	600	300	900

++ **L-Theory lecture, T – Tutorial, P – Practical, J – Project**

CIA: Continuous Internal Assessment, SEA: Semester End Assessment, NCMC: Non Credit Mandatory Course

AICTE Activity points to be earned by students admitted to BE day college programme

Over and above the academic grades, every day college regular student admitted to the 4-year Degree programme and every student entering 4 years degree programme though lateral entry, shall earn 100 and 75 activity points respectively for the award of degree through AICTE activity programme. The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hour's requirement should be fulfilled. Activity points have no effect on SGPA/CGPA and shall not be considered for vertical progression.

Bridge Course: All lateral entry students have to register and complete the course **Fundamentals of C programming** and submit the assignment to the concerned teacher handling the course **Data structures using C**.

Semester: IV EEE

Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical/ Training	Project	Total Hours		CIA	SEA	Total
					L	T	P	J					
1	BSC	24MAE141	Complex Analysis, Probability and Random Process	Mathematics	2	2	--	--	4	**3**	50	50	100
2	PCC	24EEE142	Electromagnetic Fields and Wave Theory	EEE	2	2	--	--	4	**3**	50	50	100
3	PCI	24EEE143	Electrical Motors and Synchronous Machines	EEE	3	--	2	--	5	**4**	50	50	100
4	PCI	24EEE144	Linear Control Systems	EEE	3	--	2	--	5	**4**	50	50	100
5	PBL	24EEE145	ARM processors and Applications	EEE	--	2	1	1	4	**2**	50	50	100
6	PCC	24EEE146	Data Base Management System	EEE	1	2	--	--	3	**2**	50	50	100
7	INT	24EEE147	Internship-1/Innovative Project Lab	EEE	--	--	2	2	4	**1**	100	--	100
8	AEC	24SFT148	Soft Skills - 2	T & P	--	2	--	--	2	**1**	100	--	100
			Total		11	10	7	3	**31**	**20**	500	300	800

Internship: All the students registered to II year of BE shall have to undergo mandatory internship of 4 weeks during II semester or III semester vacation. Continuous Internal Assessment (CIA) will be conducted in IV semester and the prescribed credit will be included. Internship shall be considered as a head of passing and shall be considered for the award of degree.

AICTE Activity points to be earned by students admitted to BE day college programme

Over and above the academic grades, everyday college regular student admitted to the 4-year Degree programme and every student entering 4 years degree programme though lateral entry, shall earn 100 and 75 activity points respectively for the award of degree through AICTE activity programme. The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hour's requirement should be fulfilled. Activity points have no effect on SGPA/CGPA and shall not be considered for vertical progression.

Semester: V EEE

Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical/ Training	Project	Total Hours		CIA	SEA	Total
					L	T	P	J					
1	PCC	24EEE151	AI & ML applications in Electrical systems	EEE	2	2			4	**3**	50	50	100
2	PCC	24EEE152	Digital Signal Processing	EEE	2	2	--	--	4	**3**	50	50	100
3	PCI	24EEE153	Real Time Operating System	EEE	2	--	4	--	6	**4**	50	50	100
4	PCI	24EEE154	Power Electronic Devices and Circuits	EEE	3	--	2	--	5	**4**	50	50	100
5	PBL	24EEE155	Design of digital controllers using Programmable Logic Controller	EEE	--	2	1	1	4	**2**	50	50	100
6	POE	24EEE156X	Open Elective course	EEE	2	2	--	--	4	**3**	50	50	100
7	AEC	24EEE157	Employability Skills -1 (Technical)	T & P	--	2	--	--	2	**1**	100	--	100
8	INT	24EEE158	Internship- 2	EEE	--	--	4	--	4	**2**	100	--	100
			Total		11	10	11	1	33	**22**	500	300	800

Open Elective Course			
24EEE1561	Energy Audit and Energy Management System	24EEE1563	Fundamentals of Hybrid and Electric Vehicles
24EEE1562	Non-Conventional Energy Resources	24EEE1564	Sensors and Transducers

Internship: All the students registered to III year of BE shall have to undergo mandatory internship of 4 weeks during IV semester vacation. Continuous Internal Assessment will be conducted in V semester and the prescribed credit will be included. The internship shall be slated for CIA only and will not have SEA. Internship shall be considered as a head of passing and shall be considered for the award of degree. Internship of 04 weeks during the intervening period of IV and V semesters; The letter grade earned through CIE shall be included in the V semester grade card. Those, who do not take up / complete the internship shall be considered under F(fail) grade and shall have to complete subsequently after satisfying the internship requirements.

AICTE Activity points to be earned by students admitted to BE day college programme

Over and above the academic grades, every day college regular student admitted to the 4 year Degree programme and every student entering 4 years degree programme though lateral entry, shall earn 100 and 75 activity points respectively for the award of degree through AICTE activity programme. The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hour's requirement should be fulfilled. Activity points have no effect on SGPA/CGPA and shall not be considered for vertical progression.

Semester: VI EEE

Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical/ Training	Project	Total hours		CIA	SEA	Total
					L	T	P	J					
1	PCC	24EEE161	Object Oriented Programming using Java	EEE	2	2	--	--	4	**3**	50	50	100
2	PCI	24EEE162	Computer Techniques in Power System	EEE	2	2	2	--	6	**4**	50	50	100
3	PCI	24EEE163	High Voltage & Power System Protection	EEE	3	--	2	-	5	**4**	50	50	100
4	PBL	24EEE164	Simulation of Electric vehicle and Alternate energy systems	EEE	--	--	2	2	4	**2**	50	50	100
5	PEC	24EEE165X	Professional Elective Course	EEE	3	--	--	--	3	**3**	50	50	100
6	PEC (Online Courses)	24EEE166X	Professional Elective (online Courses)	EEE	3	--	--	--	3	**3**	50	50	100
7	POE	24EEE167X	Open Elective course	EEE	2	2	--	--	4	**3**	50	50	100
8	AEC	24EEE168	Employability Skills – 2 (Technical)	T & P	--	2	--	--	2	**1**	100	--	100
			Total		15	8	6	2	31	**23**	450	350	800

Professional Elective Courses			
24EEE1651	Renewable Energy Sources	24EEE1655	Introduction to UNIX Programming
24EEE1652	Energy Audit and Energy Management System	24EEE1656	Fuzzy Logic and its applications
24EEE1653	Fundamentals of Electric and Hybrid Electric Vehicles	24EEE1657	Strategic Management
24EEE1654	Embedded Systems		

Professional Elective Courses (Online Courses)			
24EEE1661	DC Microgrids and Control	24EEE1665	Cyber Security and Privacy
24EEE1662	Industrial Automation and Drives	24EEE1666	Data Mining
24EEE1663	Advanced Power electronics Design	24EEE1667	Digital Marketing
24EEE1664	Industrial Internet of Things		

Open Elective Courses			
24EEE1671	PLC and SCADA	24EEE1673	Industrial Motor control and Automation
24EEE1672	Fuel Cell Technology	24EEE1674	Solar Photo Voltaic Systems

Semester: VII EEE

Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical/ Training	Project	Total Hours		CIA	SEA	Total
					L	T	P	J					
1	PCC	24EEE171	Engineering project Management and Finance	EEE	3	--	--	--	3	**3**	50	50	100
2	PEC	24EE172X	Professional Elective Course	EEE	3	--	--	--	3	**3**	50	50	100
3	PEC (Online Courses)	24EEE173X	Professional Elective (online Courses)	EEE	3	--	--	--	3	**3**	50	50	100
4	AEC	24EEE174	Research Methodology and IPR	EEE	1	2	--	--	3	**2**	50	50	100
5	PPW	24EEE175	Main Project- Phase 1	EEE	--	--	--	10	10	**5**	100	-	100
			Total		10	2	--	10	22	**16**	300	200	500

Professional Elective Courses			
24EEE1721	Electrical Estimation and Costing	24EEE1725	Data Visualization
24EEE1722	Utilization of Electrical Power	24EEE1726	ANN and its applications to Electrical Systems
24EEE1723	Advanced Techniques in Electric Vehicles	24EEE1727	Accounts & Financing for Engineers
24EEE1724	Digital Design through Verilog		

Professional Elective Courses (Online Courses)			
24EEE1731	Advances in UHV Transmission and Distribution	24EEE1735	Big Data Computing
24EEE1732	Digital Control systems for Industrial applications	24EEE1736	Deep Learning
24EEE1733	Charging Infrastructure	24EEE1737	Operations and Supply Chain Management
24EEE1734	Drone Systems and Control		

Project work: Based on the abilities of the students and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

Semester: VIII EEE

Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours/week					Credits	Examination		
					Theory Lecture	Tutorial	Practical/ Training	Project	Total Hours		CIA	SEA	Total
					L	T	P	J					
1	PEC (Online Courses)	24EEE181X	Professional Elective (online Courses)	EEE	3	--	--	--	3	**3**	50	50	100
2	INT	24EEE182	Internship-3	EEE	--	--	8	--	8	**8**	50	50	100
3	PPW	24EEE183	Main Project Work- Phase 2	EEE	--	--	--	20	20	**6**	50	50	100
			Total		3	--	8	20	31	**17**	150	150	300

Professional Elective Courses (Online Courses)			
24EEE1811	Smart Grid	24EEE1815	Blockchain and its Applications
24EEE1812	Computer-Aided Design of Electrical Machines	24EEE1816	Natural Language Processing
24EEE1813	Battery Technology and Battery Management System	24EEE1817	Business Analytics for Management Decision
24EEE1814	VLSI Design		

Project work: Based on the abilities of the students and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

Internship: All the students admitted to IV year of BE shall have to undergo mandatory internship of 16-17 weeks during the vacation of VI semester and during VII semester. End Assessment will be conducted in VIII semester and the prescribed credit shall be included. Internship shall be considered as a head of passing and shall be considered for the award of degree.

AICTE Activity points to be earned by students admitted to BE day college programme

Over and above the academic grades, every day college regular student admitted to the 4 year Degree programme and every student entering 4 years degree programme though lateral entry, shall earn 100 and 75 activity points respectively for the award of degree through AICTE activity programme. The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hour's requirement should be fulfilled. Activity points have no effect on SGPA/CGPA and shall not be considered for vertical progression.

Professional Elective courses: (PEC)

I. Power engineering stream: PE		**V. Information Technology – IT**	
24EEE1651	Renewable Energy Sources (Professional Elective Course)	24EEE1655	Introduction to UNIX Programming (Professional Elective Course)
24EEE1661	DC Microgrids and Control (MOOC)	24EEE1665	Cyber Security and Privacy (MOOC)
24EEE1721	Electrical Estimation and Costing (Professional Elective Course)	24EEE1725	Data Visualization
24EEE1731	Advances in UHV Transmission and Distribution (MOOC)	24EEE1735	Big Data Computing (MOOC)
24EEE1811	Smart Grid (MOOC)	24EEE1815	Blockchain and its Applications (MOOC)
II. Industrial Automation and Drives: IAD		**VI. AI & ML stream: AI**	
24EEE1652	Energy Audit and Energy Management System (Professional Elective Course)	24EEE1656	Fuzzy Logic and its applications (Professional Elective Course)
24EEE1662	Industrial Drives and Automation (MOOC)	24EEE1666	Data Mining (MOOC)
24EEE1722	Utilization of Electrical Power (Professional Elective Course)	24EEE1726	ANN and its applications to Electrical Systems (Professional Elective Course)
24EEE1732	Digital Control systems for Industrial applications (MOOC)	24EEE1736	Deep Learning (MOOC)
24EEE1812	Computer-Aided Design of Electrical Machines (MOOC)	24EEE1816	Natural Language Processing (MOOC)
III. Electric vehicle stream: EV		**VII. Management Stream:**	
24EEE1653	Fundamentals of Electric and Hybrid Electric Vehicles (Professional Elective Course)	24EEE1657	Strategic Management (Professional Elective Course)
24EEE1663	Advanced Power electronics Design (MOOC)	24EEE1667	Digital Marketing (MOOC)
24EEE1723	Advanced Techniques in Electric Vehicles (Professional Elective Course)	24EEE1727	Accounts & Financing for Engineers (Professional Elective Course)
24EEE1733	Charging Infrastructure (MOOC)	24EEE1737	Operations and Supply Chain Management (MOOC)
24EEE1813	Battery Technology and Battery Management System (MOOC)	24EEE1817	Business Analytics for Management Decision (MOOC)
IV. **VLSI and Embedded Systems: VES**			
24EEE1654	Embedded Systems and IoT (Professional Elective Course)		
24EEE1664	Industrial Internet of Things (MOOC)		
24EEE1724	Digital Design through Verilog (Professional Elective Course)		
24EEE1734	Drone Systems and Control (MOOC)		
24EEE1814	VLSI Design (MOOC)		

Open Elective -1 (V semester)			**Open Elective – 2 (VI semester)**
24EEE1561	1. Energy Audit and Energy Management System	24EEE1671	1. PLC and SCADA
24EEE1562	2. Non-Conventional Energy Resources	24EEE1672	2. Fuel Cell Technology
24EEE1563	3. Fundamentals of Electric and Hybrid Vehicles	24EEE1673	3. Industrial Motors and Control
24EEE1564	4. Sensors and Transducers	24EEE1674	4. Solar Photo Voltaic Systems