GM UNIVERSITY

PROGRAM DOCUMENT

2025 - SCHEME

B. Tech.
in
Electrical and Electronics Engineering

GM UNIVERSITY
Innovating Minds

School of Engineering
Faculty of Engineering & Technology

B.Tech. – Electrical and Electronics Engineering

PROGRAM DETAILS

Faculty	Engineering and Technology (FET)
School	School of Engineering
Department	Electrical and Electronics Engineering
Program	B.Tech., Electrical and Electronics Engineering
Dean of Faculty	Dr. Prakash S V
Director of School	Dr. Praveen J
Head of Department	Dr. Somashekhar G C

1	**Title of the Award**	B.Tech. in Electrical and Electronics Engineering
2	**Modes of Study**	Full Time
3	**Awarding Institution /Body**	GM University
4	**Joint Award**	Not Applicable
5	**Teaching Institution**	Faculty of Engineering and Technology, GM University
6	**Date of Program Specifications**	March -2025
7	**Date of Course Approval by the Academic Council of GMU**	---
8	**Next Review Date:**	---
9	**Program Approving Regulating Body and Date of Approval**	---
10	**Program Accredited Body and Date of Accreditation**	---
11	**Grade Awarded by the Accreditation Body**	---
12	**Program Accreditation Validity**	---
13	**Program Benchmark**	N/A
14	**Program Overview** The Bachelor's program in Electrical and Electronics Engineering (B.Tech. Electrical and Electronics Engineering) offers a comprehensive and forward-looking education for students aspiring to excel in the dynamic field of electrical systems, electronics, and emerging technologies. This program is meticulously designed to provide students with a solid foundation in both theoretical principles and practical applications of electrical and electronics engineering, fostering a deep understanding of creative problem-solving, circuit design, and cutting-edge	

	technologies in the electrical and electronics industry. Over the course of four years, students engage in a well-structured curriculum that seamlessly integrates core engineering principles with specialized courses in electrical and electronics engineering. The program adopts a hands-on approach, incorporating laboratory work, design projects, and internships to enable students to apply theoretical knowledge to real-world challenges in electrical and electronics systems. Key areas of study include electrical circuits, **Electrical Machines**, power systems, Electronics, Digital systems, Signal processing, and Control systems. Students also gain proficiency in using industry-standard tools, simulation software, and programming languages, preparing them for the challenges of the contemporary electrical and electronics industry. The B.Tech. Electrical and Electronics Engineering program aims to equip graduates for diverse career opportunities across various sectors, including power generation and distribution, telecommunications, electronics design and manufacturing, information technology, and renewable energy. Potential career paths encompass roles in electrical engineering firms, electronics industries, research and development, and entrepreneurship within the electrical and electronics domain. The interdisciplinary nature of electrical and electronics engineering opens avenues to explore diverse applications, enabling graduates to contribute to advancements in technology, energy efficiency, and smart systems. Continuous learning and staying abreast of the latest industry trends are crucial for graduates to thrive in the rapidly evolving field of electrical and electronics engineering. The program spans eight semesters, providing a holistic education that prepares students for a successful and impactful career in the dynamic realm of electrical and electronics innovation.
15	**Program Educational Objectives (PEOs)** The Bachelor's program in Electrical and Electronics Engineering is designed to provide a comprehensive education and foster key competencies in graduates, enabling them to contribute to the dynamic field of electrical systems and electronics. The curriculum is structured to cultivate critical thinking, analytical skills, innovation, creativity, and problem-solving abilities. Continuous learning and staying abreast of the latest developments in electrical and electronics engineering further enhance graduates' professional growth. The Program Educational Objectives include: **PEO-1**: Knowledge and Technical Skills

	The program aims to provide graduates with a strong foundation in electrical and electronics engineering principles, including circuit theory, power systems, electronics, and digital systems. Upon completion, graduates will possess the knowledge and technical skills necessary to conceptualize, design, analyze, and optimize electrical and electronics systems. They will be well-equipped to address real-world challenges in various sectors, including power generation, telecommunications, electronics design and manufacturing, and information technology. **PEO-2**: Professional Competence and Leadership To instill technical competencies, practical skills, and leadership abilities in graduates, preparing them for success in the field of electrical and electronics engineering. Graduates will excel in roles within electrical engineering firms, electronics industries, research and development, and entrepreneurial ventures within the electrical and electronics domain. They will be capable of assuming both technical and leadership positions, contributing to advancements in technology and innovation. **PEO-3**: Holistic Development and Adaptability The program aims to nurture critical thinking, creativity, innovation, collaboration, effective communication, information literacy, flexibility, adaptability, leadership, responsibility, and social and cross-cultural interaction skills. Graduates will demonstrate the ability to adapt to evolving professional environments, ensuring they contribute effectively to their respective fields. The interdisciplinary nature of electrical and electronics engineering prepares graduates for diverse career trajectories, fostering holistic development and lifelong learning. The overarching goal of the B.Tech. in Electrical and Electronics Engineering is to produce graduates who are well-prepared to meet the challenges of the dynamic electrical and electronics industry, contribute to technological advancements, and make a positive impact on society.
16	**Program Outcomes(POs) (Graduate Attributes)** **PO-1:** Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. **PO-2:** Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. **PO-3:** Design/development of solutions: Design solutions for complex engineering problems and

	design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. **PO-4:** Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. **PO-5:** Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations. **PO-6:** The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. **PO-7:** Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. **PO-8:** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. **PO-9:** Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. **PO-10:** Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. **PO-11:** Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. **PO-12:** Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
17	**Program Specific Outcomes (PSOs):**

	Upon successful completion of the Bachelor's program in Electrical and Electronics Engineering, graduates will possess the capability to: **PSO-1**: Analyze and Address Electrical and Electronics Challenges Graduates will demonstrate the ability to analyze complex electrical and electronics requirements, identify challenges, and articulate problems with necessary specifications. Leveraging their understanding of electrical circuits, power systems, and electronics principles, graduates will deliver innovative solutions, addressing issues in areas such as power generation, telecommunications, and electronics design. **PSO-2:** Apply Electrical and Electronics Engineering Concepts in System Development Graduates will be equipped to envision, model, design, simulate, develop, and test electrical and electronics systems and solutions. They will demonstrate proficiency in addressing technical challenges within the field of electrical and electronics engineering, utilizing their knowledge of digital systems, signal processing, and control systems to create efficient, reliable, and innovative solutions. **PSO-3**: Conduct and Lead Experimental Validation in Electrical and Electronics Engineering After completing the program, graduates will showcase the capability to strategize, coordinate, and execute experiments for the validation and verification of electrical and electronics systems. They will adeptly use laboratory techniques and software tools for designing and simulating electrical processes, and will be prepared to assume leadership roles in research projects, effectively managing teams and resources in the context of electrical and electronics engineering. These Program Specific Outcomes are tailored to ensure that graduates are not only well-versed in the theoretical aspects of electrical and electronics engineering but also possess the practical skills and leadership qualities required to make meaningful contributions in the field. The objectives emphasize the application of engineering principles in addressing real-world challenges and the development of innovative solutions in the realm of electrical and electronics engineering.

Programme Structure

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
2 Hr. Tutorial (T) per week	1 Credit
2 Hr. Practical (P) per week	1 Credit

Sl. No.	Program -Category	Credits
1	Program-Core courses, elective Courses, open electives	130
2	Technical Skills	10 (HG25TCXXXX)
3	Life Skills	3(HG25TPYYYY)
4	Innovation and Entrepreneurial Skills	3(HG25CIVVVV)
5	Environmental Awareness and Community Services	3(HG25SAKKKK)
6	Athletics, Sports, Yoga, Gymnasium	3(HG25SAKKKK)
7	Cultural & Literary Activities	3(HG25SAKKKK)
8	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	2(HG25CC####)
9	Placement Training	3(HG25TPYYYY)
	Total	**130+30=160**

18. Courses and Credits:

Semester-1			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE1101	Engineering Mathematics - I	3
2	UE25EE1102	Engineering Physics	3
3	UE25EE1103	Elements of Electrical Engineering	3
4	UE25EE1104	New and Renewable Energy Sources	3
5	UE25EE1105	Programming with C	4
6	UE25EE1106	Electrical Circuit Building	1
7	HG25TCXXXX	Technical Skills	0
8	HG25TPYYYY	Life Skills	0
9	HG25CIVVVV	Innovation and Entrepreneurial Skills	0
10	HG25SAKKKK	Environmental Awareness and Community Services	0
11	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	0
12	HG25SAKKKK	Cultural & Literary Activities	0
13	HG25CC####	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	0
14	HG25TPYYYY	Placement Training	0
		Total	**17**

Semester-2			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE1201	Engineering Mathematics – II	3
2	UE25EE1202	Engineering Chemistry	3
3	UE25EE1203	Fundamentals of Electronics Engineering	3
4	UE25EE1204	Electrical Power Generation	3
5	UE25EE1205	Programming with Python	4
6	UE25EE1206	Electronics Circuit Building	1
7	HG25TCXXXX	Technical Skills	2
8	HG25TPYYYY	Life Skills	1
9	HG25CIVVVV	Innovation and Entrepreneurial Skills	0
10	HG25SAKKKK	Environmental Awareness and Community Services	1
11	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	0
12	HG25SAKKKK	Cultural & Literary Activities	0
13	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	0
14	HG25TPYYYY	Placement Training	0
		Total	**21**

Semester-3			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE2301	Engineering Mathematics – III	3
2	UE25EE2302	Network Theory & Analysis	3
3	UE25EE2303	Analog Electronics	3
3	UE25EE2304	Digital Electronics	3
4	UE25EE2305	Electrical Machine-I	3
5	UE25EE2306	Electrical Machine-I Laboratory	1
8	HG25TCXXXX	Technical Skills	2
9	HG25TPYYYY	Life Skills	1
10	HG25CIVVVV	Innovation and Entrepreneurial Skills	0
11	HG25SAKKKK	Environmental Awareness and Community Services	1
12	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	1
13	HG25SAKKKK	Cultural & Literary Activities	0
14	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	0
15	HG25TPYYYY	Placement Training	1
		Total	**22**

Semester-4			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE2401	Electrical Machine-II	3
2	UE25EE2402	Electromagnetic Field Theory	2
3	UE25EE2403	Microcontrollers and Interfacing	3
4	UE25EE2404	Transmission and Distribution	3
5	UE25EE2405	Electrical Machine-II Laboratory	1
6	UE25EE2406	Microcontrollers and Interfacing Laboratory	1
8	HG25TCXXXX	Technical Skills	2
9	HG25TPYYYY	Life Skills	1
10	HG25CIVVVV	Innovation and Entrepreneurial Skills	1
11	HG25SAKKKK	Environmental Awareness and Community Services	1
12	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	1
13	HG25SAKKKK	Cultural & Literary Activities	1
14	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	0
15	HG25TPYYYY	Placement Training	1
		Total	**21**

Semester-5			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE3501	Electrical Machine Design	3
2	UE25EE3502	Digital Signal Processing	3
3	UE25EE3503	Power Electronics	3
4	UE25EE3504	Estimation and Costing	3
5	UE25EE3505	Sensors and Transducers	2
6	UE25EE3506	Power Electronics Laboratory	1
6	UE25EE3540	HVDC Transmission	3
7	UE25EE3541	Intelligent Control Systems	
8	UE25EE3542	Computer Networks	
9	HG25TCXXXX	Technical Skills	2
10	HG25TPYYYY	Life Skills	0
11	HG25CIVVVV	Innovation and Entrepreneurial Skills	0
12	HG25SAKKKK	Environmental Awareness and Community Services	0
13	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	1
14	HG25SAKKKK	Cultural & Literary Activities	0
15	HG25CC####	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	0
16	HG25TPYYYY	Placement Training	1
		Total	**22**

Semester-6			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE3601	Power System Analysis and stability	3
2	UE25EE3602	Control Systems Engineering	3
3	UE25EE3603	IoT Applications	3
4	UE25EE3604	Special Electrical Machines	2
5	UE25EE3605	Simulation of Power Electronic Circuits using MATLAB/SIMULINK	2
6	UE25EE3606	Control Systems Engineering laboratory	1
7	UE25EE3640	Energy Management and Audit	3
8	UE25EE3641	Smart Grid Technology	
9	UE25EE3642	Programmable Logic Controller	
10	HG25TCXXXX	Technical Skills	2
11	HG25TPYYYY	Life Skills	0
12	HG25CIVVVV	Innovation and Entrepreneurial Skills	1
13	HG25SAKKKK	Environmental Awareness and Community Services	0
14	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	0
15	HG25SAKKKK	Cultural & Literary Activities	1
16	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	0
17	HG25TPYYYY	Placement Training	0
		Total	**21**

Semester-7			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE4701	Computer Techniques in Power System	3
2	UE25EE4702	Energy Storage and Technologies	3
3	UE25EE4703	High Voltage & Power System Protection	3
4	UE25EE4704	Industrial Drives and Automation	3
5	UE25EE4780	Electrical Installation and Safety	2
6	UE25EE4781	Psychology for Everyday Life	
7	UE25EE4782	Aptitude Development for Career Readiness	
8	UE25EE4705	Capstone Project Phase-1	4
9	HG25TCXXXX	Technical Skills	0
10	HG25TPYYYY	Life Skills	0
11	HG25CIVVVV	Innovation and Entrepreneurial Skills	0
12	HG25SAKKKK	Environmental Awareness and Community Services	0
13	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	0
14	HG25SAKKKK	Cultural & Literary Activities	1
15	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	1
16	HG25TPYYYY	Placement Training	0
		Total	**20**

Semester-8			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UE25EE4801	AI Techniques in Electrical Engineering	2
2	UE25EE4880	Green Mobility	2
3	UE25EE4881	Leadership and Team Management	
4	UE25EE4882	Art, Culture, and Human Civilization	
5	UE25EE4802	Capstone Project Phase-II	6
6	UE25EE4803	Internship	4
7	HG25TCXXXX	Technical Skills	0
8	HG25TPYYYY	Life Skills	0
9	HG25CIVVVV	Innovation and Entrepreneurial Skills	1
10	HG25SAKKKK	Environmental Awareness and Community Services	0
11	HG25SAKKKK	Athletics, Sports, Yoga, Gymnasium	0
12	HG25SAKKKK	Cultural & Literary Activities	0
13	HG25CC####	Co-Curricular Activities (Seminar/Conference/ Exhibition/Technical Competition)	1
14	HG25TPYYYY	Placement Training	0
		Total	**16**

List of Electives Offered

Professional Elective-1 (V-Semester)

Sl. No.	Course Code	Course Title	Credits
1	UE25EE3540	HVDC Transmission	3
2	UE25EE3541	Intelligent Control Systems	3
3	UE25EE3542	Computer Networks	3

Professional Elective-2 (VI-Semester)

Sl. No.	Course Code	Course Title	Credits
1	UE25EE3640	Energy Management and Audit	3
2	UE25EE3641	Smart Grid Technology	3
3	UE25EE3642	Programmable Logic Controller	3

List of Open Electives Offered

Open Elective-1 (VII-Semester)

Sl. No.	Course Code	Course Title	Credits
1	UE25EE4780	Electrical Installation and Safety	2
2	UE25EE4781	Psychology for Everyday Life	2
3	UE25EE4782	Aptitude Development for Career Readiness	2

Open Elective-2 (VIII-Semester)

Sl. No.	Course Code	Course Title	Credits
1	UE25EE4880	Green Mobility	2
2	UE25EE4881	Leadership and Team Management	2
3	UE25EE4882	Art, Culture, and Human Civilization	2

19	**Program Delivery and Program Attainment** The program comprises several courses, each delivered according to the specifications outlined in the course documents. At the conclusion of each course, both course attainments and program attainments are computed. These attainments undergo analysis during Course Assessment Board and Program Assessment Board meetings, leading to recommendations for enhancements in subsequent offerings.
20	**Teaching and Learning Methods** 1. Face to Face Lectures using Audio-Visuals 2. Laboratory work/Fieldwork/Workshop 3. Project Based Learning 4. Problem Based Learning 5. Group Exercises/Assignments 6. Demonstrations 7. Guest Lectures 8. Industry Visit 9. Workshops, Group Discussions, Debates, Presentations 10. Project Work 11. Project Exhibitions 12. Technical Competitions
21	**Attendance** A minimumof85%attendanceis essential to appear for semester end examinations. Condoning of attendance shortage is as per the Academic Regulations of B.Tech. Programme.
22	**Assessment and Grading** 1. Every course will be assessed for a weight of 100 2. There are 4 components: a. Quiz -15% b. Class Tests: 25% c. Application Based open assignments/ Activity/project-based learning/problem-based learning and any such assessment: 20% d. Semester End Examination: 40% 3. Based on total marks scored grade is Awarded. If marks scored is: • 91 and above O (outstanding); 81-90 : A+ (Excellent); 71-80: A (Very Good); 61-70: B+ (Good); 51-60 : B (Above Average); 40 -50: C (Average); below 40: D (Not satisfactory) • If one scores D grade, the candidate is required to re-register for the course (for core courses only, students can exercises their choice in case of electives or open electives – means they can re-register or register for a different elective course) and earn the required credits • **A minimum of overall 40% is required for completion of course by acquiring minimum grade (pass) with a minimum of 40% in each component.** 4. End of each semester –grade card will be issued with SGPA displayed

23	**Award of Degree** Every student registering for the program need to complete a **minimum of 160 credits, completing a minimum of 130 credits in academic courses (Core, elective, open elective) for the award of the degree**. **Award of Degree Certificate:** Students will be issued consolidated grade card with CGPA displayed and GM University Degree Certificate. **Award of Gold Medal:** A student with highest CGPA (Not less than 9.0 on a scale of 10) in the class without getting a D grade in any course over 8 semester and completing the program within the specified period of 4 years (8 semesters) will be awarded Gold Medal.
24	**Student Support for Learning** 1. Course Notes 2. Reference Books in the Library 3. Magazines and Journals 4. Internet Facility 5. Computing Facility 6. Laboratory Facility 7. Workshop Facility 8. Staff Support 9. Lounges for Discussions 10. Any other support that enhances their learning
25	**Quality Control Measures** 1. Review of Course Notes 2. Review of Question Papers and Assignment Questions 3. Student Feedback 4. Moderation of Assessed Work 5. Opportunities for students to see their assessed work 6. Review by external examiners and external examiners reports 7. Staff Student Consultative Committee meetings 8. Student exit feedback 9. Course Assessment Board (CAB) 10. Programme Assessment Board (PAB)

26. Mapping of POs with Cos.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course-1												
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												
Course-2												
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												

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