



**CURRICULUM  
2023  
(Autonomous)  
Draft  
Version 1.0**

**B.TECH  
ELECTRICAL AND ELECTRONICS ENGINEERING**

**MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**  
Mar Ivanios Vidyanagar, Nalanchira, Thiruvananthapuram – 695 015  
**August 2023**



# CURRICULUM

FOR

**B. TECH DEGREE PROGRAMME**

IN

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**SEMESTERS I to VIII**

**2023 SCHEME  
(AUTONOMOUS)**



**MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**

(Approved by AICTE, Autonomous Institution Affiliated to APJ Abdul Kalam Technological University)  
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**MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**THIRUVANANTHAPURAM-695015**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Vision and Mission of the Institution**

**Vision:**

To be an Institution moulding globally competent professionals as epitomes of Noble Values.

**Mission:**

To transform the Youth as technically competent, ethically sound and socially committed professionals, by providing a vibrant learning ambience for the welfare of humanity.

**Vision and Mission of the Department**

**Vision:**

To be a Centre of Excellence in Electrical and Electronics Engineering Education, Research and Application of knowledge to benefit the society at large.

**Mission:**

To mould quality Electrical Engineers, fostering creativity and innovation to address global issues.

**Programme Educational Objectives (PEOs)**

1. Graduates will succeed as Professionals in Industry or as Entrepreneurs in Electrical and Electronics Engineering and related disciplines.
2. Graduates will be able to adapt to the advances in Technology by continuously acquiring knowledge and skills, with an urge for innovation.
3. Graduates will be socially committed individuals, exhibiting professional ethics in addressing technical and engineering challenges.

**Programme Outcomes (POs)**

Engineering Graduates will have the ability to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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.
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.

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.
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.
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.
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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
12. **Life-long 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.

### **Programme Specific Outcomes (PSOs)**

Engineering Graduates will have the ability:

1. To apply the knowledge in Electrical and Electronics Engineering for the design of Power Generation, Transmission, Distribution and Utilization systems.
2. To demonstrate the knowledge required to design, develop, test, and implement Electrical & Electronics systems.

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING****B.TECH. PROGRAMME IN ELECTRICAL AND ELECTRONICS ENGINEERING***For the students admitted from 2023-24***SCHEDULING OF COURSES****i) Medium of Instruction: English****ii) Knowledge Segments and Credits**

Every course of BTech Programme is placed in one of the nine categories as listed in table below. No semester shall have more than six lecture-based courses and two laboratory courses, and/or drawing/seminar/project courses in the curriculum.

*Table 1: Credit distribution and the Knowledge Domains*

Sl. No.	Category	Category Code	Proposed 2023 Curriculum
1	Humanities and Social Sciences including Management Courses	HSC	9
2	Basic Science Courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Programme Core Courses,	PCC	66
5	Programme Elective Courses	PEC	18
6	Institute Elective Courses	IEC	6
7	Seminar, Mini Project, Project Work and Comprehensive Course Viva Voce	PWS	13
8	Mandatory Non-credit Courses (P/F) with Grade	MNC	---
9	Mandatory Student Activities (P/F)	MSA	1+1+1
<b>Total Mandatory Credits</b>			<b>163</b>
	Value Added Courses (Optional) – Honours/Minor	VAC	15

**ii) Semester-wise Credit Distribution**

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits for Courses	18	20	21	21	21	23	18	18	160
Year wise Credit	38		42		44		36		160
Credits for Activities	3								3
Total Credits									163
Value Added Courses (Optional) – Honours / Minor									15
Total Credits									178



**Humanities and Social Sciences including Management Courses:** Universal Human Values, Management for Engineers, Business Economics and Accountancy.

**Basic Science Courses:** Mathematics, Engineering Physics, Engineering Chemistry, Engineering Physics and Chemistry Labs.

**Engineering Science Courses:** Basics of Electrical and Electronics Engineering, Engineering Mechanics, Engineering Graphics, Design Engineering, Programming in Python, Problem Solving and programming in C, Manufacturing and Construction Practices B, Electrical and Electronics Workshop.

**Mandatory Non-credit Courses:** Environmental Science, Professional Communication, Professional Ethics, Industrial Safety Engineering.

### General Guidelines

Three hours are kept exclusively for the Remedial / Minor/ Honours courses from third to seventh semester. For the mini project of Minor or Honours in S7/S8, 7 hours are allotted. If a student does not opt for Minor/Honours courses, he/she can be given remedial classes.

SEMESTER I						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL10A	Linear Algebra and Calculus	3-1-0-0	4	4
B	BSC	23CYL10A	Engineering Chemistry	3-1-0-0	4	4
C	ESC	23ESB10A	Engineering Graphics	2-0-2-0	4	3
D	ESC	23ESB10B	Problem Solving and Programming in C	2-1-2-0	5	4
G	MNC	23NCL10A	Environmental Science	2-0-0-0	2	---
S	BSC	23CYP10A	Engineering Chemistry Lab	0-0-2-0	2	1
T	ESC	23ESB10C	Manufacturing and Construction Practices B	1-0-2-0	3	2
<b>TOTAL</b>					<b>24</b>	<b>18</b>

SEMESTER II						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL10B	Vector Calculus, Differential Equations and Transforms	3-1-0-0	4	4
B	BSC	23PYL10A	Engineering Physics	3-1-0-0	4	4
C	ESC	23ESL10C	Engineering Mechanics	2-1-0-0	3	3
E	ESC	23ESL10D	Basics of Electrical Engineering	2-0-0-0	4	2
		23ESL10E	Basics of Electronics Engineering	2-0-0-0		2
F	ESC	23ESB10F	Python Programming	2-0-2-0	4	3
G	MNC	23NCJ10B	Professional Communication	2-0-0-2	4	---
S	BSC	23PYP10A	Engineering Physics Lab	0-0-2-0	2	1
T	ESC	23ESP10A	Electrical and Electronics Workshop	0-0-2-0	2	1
<b>TOTAL</b>					<b>27</b>	<b>20</b>



SEMESTER III						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL20A	Partial Differential Equation and Complex Analysis	3-1-0-0	4	4
B	PCC	23EEB20A	Digital Electronics and Logic Design	3-1-2-0	6	5
C	PCC	23EEL20B	Measurements and Instrumentation	3-1-0-0	4	4
D	PCC	23EEL20C	Electric Circuit Analysis	3-1-0-0	4	4
E	ESC	23ESL00A	Design Engineering	2-0-0-0	2	2
G	MNC	23NCL20A	Professional Ethics	2-0-0-0	2	---
S	PCC	23EEP20A	Electrical Network Lab	0-0-2-0	2	1
T	PCC	23EEP20B	Simulation Lab	0-0-2-0	2	1
R/M	VAC		Remedial/Minor Course	3-0-0-0/ 2-1-0-0	3	3
<b>TOTAL</b>					<b>26/29</b>	<b>21/24</b>

SEMESTER IV						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL20C	Probability, Random Processes and Numerical Methods	3-1-0-0	4	4
B	PCC	23EEL20D	Electronic Devices and Circuits	3-1-0-0	4	4
C	PCC	23EEL20E	DC Machines and Transformers	2-1-0-0	3	3
D	PCC	23EEB20F	Microcontroller and Applications	3-1-2-0	6	5
E	HSC	23HSL20A	Universal Human Values - II	2-1-0-0	3	3
G	MNC	23NCL20B	Industrial Safety Engineering	2-1-0-0	3	---
S	PCC	23EEP20C	Measurements Lab	0-0-2-0	2	1
T	PCC	23EEP20D	Electronic Devices and Circuits Lab	0-0-2-0	2	1
R/M/H	VAC		Remedial/Minor/Honours Course	3-0-0-0/ 2-1-0-0	3	3
<b>TOTAL</b>					<b>27/30</b>	<b>21/24</b>

SEMESTER V						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	PCC	23EEL30A	Power Electronics and Drives	3-0-0-0	3	3
B	PCC	23EEL30B	Signals and System Analysis	3-1-0-0	4	4
C	PCC	23EEL30C	Synchronous and Induction Machines	3-1-0-0	4	4
D	PEC	23EEL31X	Program Elective I	3-0-0-0/ 2-1-0-0	3	3
E	HSC	23HSL00A	Business Economics and Accountancy	3-0-0-0	3	3
S	PCC	23EEP30A	Electrical Machines Lab	0-0-3-0	3	2
T	PCC	23EEP30B	Power Electronics Lab	0-0-3-0	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-0-0-0/ 2-1-0-0	3	3
<b>TOTAL</b>					<b>23/26</b>	<b>21/24</b>



SEMESTER VI						
Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	PCC	23EEL30D	Linear Control Systems	3-1-0-0	4	4
B	PCC	23EEL30E	Power Systems I	2-1-0-0	3	3
C	PCC	23EEL30F	Electromagnetic Theory and Compatibility	3-1-0-0	4	4
D	PEC	23EEL32X	Program Elective II	3-0-0-0/ 2-1-0-0	3	3
E	IEC	23IEL31X	Institute Elective I	3-0-0-0	3	3
S	PWS	23EES38A	Seminar	0-0-4-0	4	2
T	PWS	23EEJ38B	Mini Project	0-0-4-0	4	2
U	PCC	23EEP30C	Control Systems Lab	0-0-3-0	3	2
R/M/ H	VAC		Remedial/Minor/Honours Course	3-0-0-0/ 2-1-0-0	3	3
<b>TOTAL</b>					<b>28/31</b>	<b>23/26</b>

MICRO SPECIALIZATION STREAM		
No.	STREAM	CODE
1.	Power and Energy Systems	PES
2.	Power Electronics and Drives	PED
3.	Control Systems and Automation	CSA
4.	Electronics and Instrumentation	EIN
5.	Artificial Intelligence and Machine Learning	AML

POWER AND ENERGY SYSTEMS						
Category	No.	Course	Semester	L-T-P-J	Hours	Credit
PEC	1.	Renewable Energy Systems	S5	3-0-0-0	3	3
	2.	Illumination Engineering	S6	3-0-0-0	3	3
	3.	Power Quality	S7	3-0-0-0	3	3
	4.	Energy Management and Auditing	S7	3-0-0-0	3	3
	5.	Smart Grids	S8	3-0-0-0	3	3
	6.	Power System Protection	S8	3-0-0-0	3	3
	7.	Computer Aided Power System Analysis	S8	2-1-0-0	3	3
	8.	Electrical System Design for Industry and Infrastructure	S8	2-1-0-0	3	3
	9.	HVDC and FACTS	S8	3-0-0-0	3	3
	10.	High Voltage Engineering	S8	3-0-0-0	3	3
	11.	Solar PV Systems	S8	3-0-0-0	3	3





POWER ELECTRONICS AND DRIVES						
Category	No.	Course	Semester	L-T-P-J	Hours	Credit
PEC	1.	Material Science	S5	3-0-0-0	3	3
	2.	Electrical Drawing with CAD	S6	2-1-0-0	3	3
	3.	Advanced Electric Drives	S6	3-0-0-0	3	3
	4.	Electrical Machine Design	S6	3-0-0-0	3	3
	5.	Switch Mode Power Converters	S7	3-0-0-0	3	3
	6.	Special Electric Machines	S7	3-0-0-0	3	3
	7.	Energy Storage Systems	S8	3-0-0-0	3	3
	8.	Electric and Hybrid Vehicles	S8	3-0-0-0	3	3
CONTROL SYSTEMS AND AUTOMATION						
Category	No.	Course	Semester	L-T-P-J	Hours	Credit
PEC	1.	Embedded Systems	S5	3-0-0-0	3	3
	2.	Industrial Instrumentation and Automation	S6	3-0-0-0	3	3
	3.	Digital System Design Using Verilog	S6	2-1-0-0	3	3
	4.	Introduction to Robotics	S7	2-1-0-0	3	3
	5.	Advanced Control Systems	S7	3-0-0-0	3	3
	6.	Digital Control Systems	S8	3-0-0-0	3	3
	7.	Modern Control Techniques	S8	2-1-0-0	3	3
ELECTRONICS AND INSTRUMENTATION						
Category	No.	Course	Semester	L-T-P-J	Hours	Credit
PEC	1.	Sensors and Sensing Techniques	S5	3-0-0-0	3	3
	2.	Biomedical Instrumentation	S5	3-0-0-0	3	3
	3.	Introduction to Nanotechnology	S6	3-0-0-0	3	3
	4.	Digital Signal Processing	S7	2-1-0-0	3	3
	5.	Communication Engineering	S8	3-0-0-0	3	3
	6.	Automotive Electronic Systems	S8	3-0-0-0	3	3
	7.	Digital Image Processing	S8	3-0-0-0	3	3
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING						
Category	No.	Course	Semester	L-T-P-J	Hours	Credit
PEC	1.	Object Oriented Programming	S5	3-0-0-0	3	3
	2.	Data Structures	S5	2-1-0-0	3	3
	3.	Introduction to Soft Computing	S6	3-0-0-0	3	3
	4.	Internet of Things	S6	3-0-0-0	3	3
	5.	Introduction to Machine Learning	S7	3-0-0-0	3	3
	6.	Introduction to Computer Networks	S7	3-0-0-0	3	3
	7.	VR and AR for Assistive Technology	S8	3-0-0-0	3	3
	8.	Data Analytics for Electrical Engineers	S8	3-0-0-0	3	3
	9.	Introduction to Artificial Neural Networks	S8	3-0-0-0	3	3



**PROGRAM ELECTIVE I**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
D	PEC	23EEL31A	Renewable Energy Systems	3-0-0-0	3	3	PES
		23EEL31B	Material Science	3-0-0-0	3	3	PED
		23EEL31C	Embedded Systems	3-0-0-0	3	3	CSA
		23EEL31D	Sensors and Sensing Techniques	3-0-0-0	3	3	EIN
		23EEL31E	Biomedical Instrumentation	3-0-0-0	3	3	EIN
		23EEL31F	Object Oriented Programming	3-0-0-0	3	3	AML
		23EEL3G	Data Structures	2-1-0-0	3	3	AML

**PROGRAM ELECTIVE II**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
D	PEC	23EEL32A	Illumination Engineering	2-1-0-0	3	3	PES
		23EEL32B	Electrical Drawing with CAD	2-1-0-0	3	3	PED
		23EEL32C	Electric Drives	3-0-0-0	3	3	PED
		23EEL32D	Industrial Instrumentation and Automation	3-0-0-0	3	3	CSA
		23EEL32E	Digital System Design Using Verilog	2-1-0-0	3	3	CSA
		23EEL32F	Introduction to Nanotechnology	3-0-0-0	3	3	EIN
		23EEL32G	Introduction to Soft Computing	3-0-0-0	3	3	AML
		23EEL32H	Internet of Things	3-0-0-0	3	3	AML

**INSTITUTE ELECTIVE I**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit
E	IEC	23IEL31A	Introduction to Flight Dynamics and Control	3-0-0-0	3	3
		23IEL31B	Introduction to Power Processing	3-0-0-0	3	3
		23IEL31C	Electrical Drives and Control for Automation	3-0-0-0	3	3
		23IEL31D	Renewable Energy Sources	3-0-0-0	3	3

**SEMESTER VII**

Slot	Category Code	Course Code	Courses	L-T-P-J	Hours	Credit
A	PCC	23EEL40A	Power Systems II	2-1-0-0	3	3
B	PCC	23EEJ40B	Computer Aided Electrical System Design for Domestic Dwellings	2-1-0-1	4	4
C	PEC	23EEL43X	Program Elective III	3-0-0-0	3	3
E	IEC	23IEL42X	Institute Elective II	3-0-0-0	3	3
S	PWS	23EEV48A	Comprehensive Course Viva Voce	0-0-2-0	2	1
T	PWS	23EEJ48B	Project Phase I	0-0-4-0	4	2
U	PCC	23EEP40A	Power Systems Lab	0-0-2-0	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	0-1-4-0/ 3-0-0-0	5/3	3
<b>TOTAL</b>					<b>22/ (27/25)</b>	<b>18/21</b>



### PROGRAM ELECTIVE III

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
C	PEC	23EEL43A	Energy Management and Auditing	3-0-0-0	3	3	PES
		23EEL43B	Power Quality	3-0-0-0	3	3	PES
		23EEL43C	Electrical Machine Design	2-1-0-0	3	3	PED
		23EEL43D	Switch Mode Power Converters	3-0-0-0	3	3	PED
		23EEL43E	Introduction to Robotics	2-1-0-0	3	3	CSA
		23EEL43F	Advanced Control Systems	3-0-0-0	3	3	CSA
		23EEL43G	Digital Signal Processing	2-1-0-0	3	3	EIN
		23EEL43H	Introduction to Machine Learning	3-0-0-0	3	3	AML
		23EEL43I	Introduction to Computer Networks	3-0-0-0	3	3	AML

### INSTITUTE ELECTIVE II

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit
E	IEC	23IEL42A	Architectural Lighting Design and Control	2-1-0-0	3	3
		23IEL42B	Electric Vehicles	3-0-0-0	3	3
		23IEL42C	Process Control and Automation	3-0-0-0	3	3
		23IEL42D	Sustainable Energy Management	3-0-0-0	3	3

SEMESTER VIII						
Slot	Category	Course Code	Courses	L-T-P-J	Hours	Credit
A	PEC	23EEL44X	Program Elective IV	3-0-0-0	3	3
B	PEC	23EEL45X	Program Elective V	3-0-0-0/ 2-1-0-0	3	3
C	PEC	23EEL46X	Program Elective VI	3-0-0-0/ 2-1-0-0	3	3
D	HSC	23HSL00A	Management for Engineers	3-0-0-0	3	3
S	PWS	23EEJ48C	Project Phase II	0-0-12-0	12	6
R/M/H	VAC		Remedial/Minor/Honours Course	0-1-4-0	5	3
<b>TOTAL</b>					<b>24/29</b>	<b>18/21</b>

**PROGRAM ELECTIVE IV**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
A	PEC	23EE44A	Smart Grids	3-0-0-0	3	3	PES
		23EE44B	HVDC and FACTS	3-0-0-0	3	3	PES
		23EE44C	Energy Storage Systems	3-0-0-0	3	3	PED
		23EE44D	Digital Control Systems	2-1-0-0	3	3	CSA
		23EE44E	Communication Engineering	3-0-0-0	3	3	EIN
		23EE44F	Data Analytics for Electrical Engineers	3-0-0-0	3	3	AML

**PROGRAM ELECTIVE V**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
B	PEC	23EEL45A	Solar PV Systems	3-0-0-0	3	3	PES
		23EEL45B	Power System Protection	3-0-0-0	3	3	PES
		23EEL45C	Electric and Hybrid Vehicles	3-0-0-0	3	3	PED
		23EEL45D	Modern Control Techniques	3-0-0-0	3	3	CSA
		23EEL45E	Digital Image Processing	3-0-0-0	3	3	EIN
		23EEL45F	VR and AR for Assistive Technology	3-0-0-0	3	3	AML

**PROGRAM ELECTIVE VI**

Slot	Category	Course Code	Course	L-T-P-J	Hours	Credit	Specialization
C	PEC	23EE45A	Electrical System Design for Industry and Infrastructure	2-1-0-0	3	3	PES
		23EE45B	High Voltage Engineering	3-0-0-0	3	3	PES
		23EE45C	Computer Aided Power System Analysis	2-1-0-0	3	3	PES
		23EE45D	Special Electric Machines	3-0-0-0	3	3	PED
		23EE45E	Automotive Electronic Systems	3-0-0-0	3	3	EIN
		23EE45F	Introduction to Artificial Neural Networks	3-0-0-0	3	3	AML



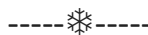
**B Tech (MINOR)**

Semester	BASKET I				BASKET II				BASKET III				BASKET IV			
	Embedded Systems for Industrial Applications				Architectural Lighting and Electrical System Design				Clean and Sustainable Energy				Electric Vehicle Systems			
	Course Code	Course	L-T-P-J	Credit	Course Code	Course	L-T-P-J	Credit	Course Code	Course	L-T-P-J	Credit	Course Code	Course	L-T-P-J	Credit
S3	23EEL2MA	Micro Controllers and Embedded Systems	3-0-0-0	3	23EEL2MB	Basics of Illumination Science and Lighting Design	3-0-0-0	3	23EEL2MC	Sustainable Energy Systems	3-0-0-0	3	23EEL2MD	Electric Machinery	3-0-0-0	3
S4	23EEL2ME	Hardware Interfacing using Arduino -C Platform	3-0-0-0	3	23EEL2MF	Electric Power Supply and Distribution Systems	3-0-0-0	3	23EEL2MG	Renewable Energy in Power Grids	3-0-0-0	3	23EEL2MH	Power Electronics and Energy Storage Devices	3-0-0-0	3
S5	23EEL3MA	Raspberry Pi - Python Interface for Electrical Engineering	3-0-0-0	3	23EEL3MB	Energy efficiency in Buildings	3-0-0-0	3	23EEL3MC	Solar and Wind Energy Conversion Systems	2-1-0-0	3	23EEL3MD	Hybrid and Electric Vehicles	3-0-0-0	3
S6	23EEL3ME	Cloud Computing for Internet of Things	3-0-0-0	3	23EEL3MF	Electrical System Design and Building services	2-1-0-0	3	23EEL3MG	Smart Grid and Energy Storage Systems	3-0-0-0	3	23EEL3MH	Automotive Electrical & Electronic systems	3-0-0-0	3
S7	23EEL4MA	Mini Project	0-1-4-0	3	23EEL4MA	Mini Project	0-1-4-0	3	23EEL4MA	Mini Project	0-1-4-0	3	23EEL4MA	Mini Project	0-1-4-0	3
S8	23EEL4MB	Mini Project	0-1-4-0	3	23EEL4MB	Mini Project	0-1-4-0	3	23EEL4MB	Mini Project	0-1-4-0	3	23EEL4MB	Mini Project	0-1-4-0	3



**BTech (HONOURS)**

Semester	GROUP I				GROUP II				GROUP III			
	Course Code	Course	L-T-P-J	Credit	Course Code	Course	L-T-P-J	Credit	Course Code	Course	L-T-P-J	Credit
S4	23EEL2HA	Network Analysis and Synthesis	2-1-0-0	3	23EEL2HB	Network Analysis and Synthesis	2-1-0-0	3	23EEL2HC	Network Analysis and Synthesis	2-1-0-0	3
S5	23EEL3HA	Renewable Energy Resources and Distributed Generation	3-0-0-0	3	23EEL3HB	Elements of Solar Energy Conversion	3-0-0-0	3	23EEL3HC	Solar Photovoltaic Fundamentals	3-0-0-0	3
S6	23EEL3HD	Analysis of Electrical Machines	2-1-0-0	3	23EEL3HE	Analysis of Power Electronic Circuits	2-1-0-0	3	23EEL3HF	Operation and Control of Power Systems	3-0-0-0	3
S7	23EEL4HA	Operation and Control of Generators	3-0-0-0	3	E23EEL4HB	Dynamics of Power Converters	2-1-0-0	3	23EEL4HC	Control and Dynamics of Microgrids	3-0-0-0	3
S8	23EEL4HA	Mini Project	0-1-4-0	3	23EEL4HA	Mini Project	0-1-4-0	3	23EEL4HA	Mini Project	0-1-4-0	3



{Subject to Approval by the competent Authorities}