

**(3.) B. Tech. – M. Tech. Dual Degree Programme from the Department of Electrical Engineering**

**(i) B. Tech. in Electrical and Electronics Engineering (EEE) and M. Tech. in Power and Control System**

<p><b>Program Learning Objectives:</b></p> <p>(i) Specialized training in the field of Power and Control system.</p> <p>(ii) Develop an orientation towards industrial training on specialized field.</p> <p>(iii) Imparting world class training to develop the foundation for making world class researcher in this field of research.</p> <p>(iv) Work collaboratively in multidisciplinary teams, demonstrating effective teamwork and communication to solve complex engineering problems.</p> <p>(v) Recognize the importance of ongoing professional development, engaging in activities such as certifications, workshops, and conferences to stay updated of industry trends.</p>	<p><b>Program Learning Outcomes:</b></p> <p>The graduates of this program will have</p> <ul style="list-style-type: none"> <li>● strong fundamentals in Power and Control system engineering.</li> <li>● ability to analyze and synthesize engineering problems including design and conduct experiments, use standard test equipment and interpret experimental data.</li> <li>● ability to design prototypes for real world problems.</li> <li>● ability to work in a multidisciplinary team environment.</li> <li>● ability to appreciate the complexities of professional environments, including taking responsibility for oneself, working effectively and professionally as a team member, and being mindful of ethical, economic, and contemporary concerns.</li> <li>● ability to continue learning in Power and Control system field.</li> <li>● ability to independently accomplish engineering tasks related to Power and Control research areas.</li> <li>● ability to enter industry with the engineering techniques, skills, and tools required to be able to solve real-world problems in Power and Control system engineering.</li> </ul>
<p><b>Program Goal 1:</b> Academic excellence by providing a curriculum that aligns with industry standards and encourages critical thinking in Power and Control system engineering.</p>	<p><b>Program Learning Outcome 1a:</b> Highly skilled market ready manpower to serve the emerging electrical and electronic sectors</p> <p><b>Program Learning Outcome 1b:</b> Skilled Human resource to cater the needs of next generation power systems and EV technologies.</p>
<p><b>Program Goal 2:</b> A culture of research and innovation by promoting faculty and student involvement in innovative projects in Power and Control system technologies.</p>	<p><b>Program Learning Outcome 2a:</b> Trained researchers for implementing research projects in line with national priorities such as Energy, EVs, Smart Grids, Green Technologies.</p> <p><b>Program Learning Outcome 2b:</b> Design and develop innovative smart technologies/products in energy and EVs as per the societal need</p>
<p><b>Program Goal 3:</b> To design dynamic and flexible course structures for UG</p>	<p><b>Program Learning Outcome 3a:</b> Industry relevant UG, PG, and research programs</p>

and PG programs as per the changing requirement of the industries.	<b>Program Learning Outcome 3b:</b> Trained manpower as per the industry requirement.
<b>Program Goal 4:</b> To promote entrepreneurship among the students in the field of Power and Control system engineering	<b>Program Learning Outcome 4a:</b> Realization of working prototype towards product development <b>Program Learning Outcome 4b:</b> Promotion of in-house technology-based ventures catering societal needs.

Sl. No.	Subject Code	SEMESTER III	L	T	P	C
1.	EE2101	Measurements and Instrumentation	3	0	2	4
2.	EE2102	Network Analysis and Synthesis	3	0	0	3
3.	EC2101	Analog Circuits	3	0	2	4
4.	EC2102	Signals and Systems	3	1	0	4
5.	EE2103	Electrical Machines – I	2	0	2	3
6.	HS21PQ	HSS Elective I	3	0	0	3
<b>TOTAL</b>			<b>17</b>	<b>1</b>	<b>6</b>	<b>21</b>

Sl. No.	Subject Code	SEMESTER IV	L	T	P	C
1.	EC2201	Digital Electronics	3	0	2	4
2.	EC2202	Microprocessor	2	0	2	3
3.	EE2201	Control Systems	3	0	2	4
4.	EE2202	Electrical Machines-II	2	0	2	3
5.	EC2204	Internet of Things	3	0	0	3
6.	XX22PQ	IDE I	3	0	0	3
<b>TOTAL</b>			<b>16</b>	<b>0</b>	<b>8</b>	<b>20</b>

Sl. No.	Subject Code	SEMESTER V	L	T	P	C
1.	EC3101	Microcontroller and Embedded System	3	0	2	4
2.	EE3101	Power Systems-I	2	0	2	3
3.	EE3102	Modern Control Theory	3	0	2	4
4.	EC3104	Engineering Electromagnetics	3	0	0	3
5.	EC3105	Random Signals and Stochastic Processes	3	0	0	3
6.	XX31PQ	IDE II	3	0	0	3
<b>TOTAL</b>			<b>17</b>	<b>0</b>	<b>6</b>	<b>20</b>

Sl. No.	Subject Code	SEMESTER VI	L	T	P	C
1.	EE3201	Fundamentals of Electric Drives	3	0	2	4
2.	EC3202	Digital Signal Processing	3	0	2	4
3.	EC3203	Introduction to AI/ML	3	0	0	3
4.	EE3202	Power System II	3	0	2	4
5.	EE3203	Power Electronics	3	0	2	4
6.	EE3204	Electrical Machine Design	1	0	2	2
<b>TOTAL</b>			<b>16</b>	<b>0</b>	<b>10</b>	<b>21</b>

Sl. No.	Subject Code	SEMESTER VII	L	T	P	C
1.	EE41xx	B. Tech. Elective – I	3	0	0	3
2.	EE41xx	B. Tech. Elective – II	3	0	0	3
3.	HS41PQ	HSS Elective - II	3	0	0	3
4.	XX41PQ	IDE - III	3	0	0	3
5.	EE4196	Summer Internship*	0	0	12	3
6.	EE4197	Project – I	0	0	12	6
7.	EE5101	Computer Aided Power System Analysis	3	0	2	4
<b>TOTAL</b>			<b>15</b>	<b>0</b>	<b>26</b>	<b>25</b>

Sl. No.	Subject Code	SEMESTER VIII	L	T	P	C
1.	EE5201	Power System Dynamics, Control and Protection	3	0	2	4
2.	EE5202	Nonlinear Dynamical Systems	3	0	2	4
3.	XX52PQ/XX62PQ	M. Tech. Elective – I	3	0	0	3
4.	EE4297	Project – II	0	0	12	6
5.	RM6201	Research Methodology	3	1	0	4
<b>TOTAL</b>			<b>12</b>	<b>1</b>	<b>16</b>	<b>21</b>

Sl. No.	Subject Code	SEMESTER IX	L	T	P	C
1.	XX52PQ/XX62PQ	M. Tech. Elective – II	3	0	0	3
2.	XX52PQ/XX62PQ	M. Tech. Elective – III	3	0	0	3
3.	XX52PQ/XX62PQ	M. Tech. Elective – IV	3	0	0	3
4.	EE5197	Project – III	0	0	16	8
<b>TOTAL</b>			<b>9</b>	<b>0</b>	<b>16</b>	<b>17</b>

Sl. No.	Subject Code	SEMESTER X	L	T	P	C
1.	EE5297	Project IV	0	0	36	18
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>36</b>	<b>18</b>
<b>Grand TOTAL (Semester I to X)</b>			<b>209</b>			

### Elective Courses:

#### Semester VII

<b>B. Tech. Elective - I</b>	<b>B. Tech. Elective - II</b>
EE4101 Electrical Traction and Propulsion	EC4101 Introduction to Quantum Computing
EC4102 Deep Learning for Video Surveillance Systems	EC4105 Digital Image Processing
EC4103 FPGA based System Design	EE4102 Power System Reliability

#### Semester VIII

<b>M. Tech. Elective - I</b>	
EE6218	Power System Optimization
EE6213	Advance Electric Drives
EE6215	Random Signals and Systems
EE6216	Quantitative Feedback Theory
EC6270	Advance FPGA Platform and System
EE6219	Optimal Control
EE6217	HVDC Transmission Systems

#### Semester IX

<b>M. Tech. Elective - II</b>	<b>M. Tech. Elective - III</b>	<b>M. Tech. Elective - IV</b>
EE5111 Renewable Energy Integration	EE5113 Power System Deregulation	EE5112 Energy Storage Systems
EE6111 Advanced Power System Reliability	EE6113 Advanced Power System Protection	EE6112 V2G and G2V Technology
EE6114 Advanced State Estimation and Target Tracking	EE6115 Switched Mode Power Converters	EC6155 Emerging Technologies for Beyond 5G
EE6117 Multivariable Control System	EE6116 Advanced Digital Control System	
EC6150 CMOS Phase Locked Loops	EC5111 VLSI Architectural Design and Implementation	