

**13.Courses of Study and Scheme of Assessment  
M.E. EMBEDDED AND REAL-TIME SYSTEMS**

**(2021 REGULATIONS)  
(Minimum No. of credits to be earned: 70)**

Course Code	Course Title	Periods/Week			Credits	Maximum Marks			CAT
		Lecture	Tutorial	Practical		CA	FE	Total	
<b>I SEMESTER</b>									
21EE01	Applied Mathematics for Embedded Systems	2	1	0	3	50	50	100	PC
21EE02	Embedded Controllers and Applications	3	0	0	3	50	50	100	PC
21EE03	Real-Time Concepts for Embedded Systems	3	1	0	4	50	50	100	PC
21EE04	FPGA based System Design	3	1	0	4	50	50	100	PC
21EE05	Embedded System Networks	3	0	0	3	50	50	100	PC
21EE06	Research Methodology and IPR	2	0	0	2	50	50	100	RMC
21EE72	Audit Course I	2	0	0	Grade	100	0	100	MC
21EE51	Embedded System Design Laboratory	0	0	4	2	50	50	100	PC
21EE52	Object Computing and Data Structures Laboratory	0	0	4	2	50	50	100	PC
<b>Total 29 Periods</b>		<b>18</b>	<b>3</b>	<b>8</b>	<b>23</b>	<b>500</b>	<b>400</b>	<b>900</b>	
<b>II SEMESTER</b>									
21EE07	Real-Time Operating Systems	3	1	0	4	50	50	100	PC
21EE08	Linux Architecture and Device Drivers	3	1	0	4	50	50	100	PC
21EE__	Professional Elective I	3	0	0	3	50	50	100	PE
21EE__	Professional Elective II	3	0	0	3	50	50	100	PE
21EE__	Professional Elective III	3	0	0	3	50	50	100	PE
21EE82	Audit Course II	2	0	0	Grade	100	0	100	MC
21EE61	Real-Time Systems Laboratory	0	0	4	2	50	50	100	PC
21EE62	Embedded Networking and Device Drivers Laboratory	0	0	4	2	50	50	100	PC
21EE63	Industrial Visit and Technical Seminar	0	0	4	2	100	0	100	EEC
<b>Total 31 Periods</b>		<b>17</b>	<b>2</b>	<b>12</b>	<b>23</b>	<b>550</b>	<b>350</b>	<b>900</b>	
<b>III SEMESTER</b>									
21EE__	Professional Elective IV	3	0	0	3	50	50	100	PE
21EE__	Open Elective	3	0	0	3	50	50	100	OE
21EE71	Project Work I	0	0	12	6	100	0	100	EEC
<b>Total 18 Periods</b>		<b>6</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>200</b>	<b>100</b>	<b>300</b>	
<b>IV SEMESTER</b>									
21EE81	Project Work II	0	0	24	12	50	50	100	EEC
<b>Total 24 Periods</b>		<b>0</b>	<b>0</b>	<b>24</b>	<b>12</b>	<b>50</b>	<b>50</b>	<b>100</b>	
<b>PROFESSIONAL ELECTIVE THEORY COURSES (Four to be opted)</b>									
21EE21	Internet of Things	3	0	0	3	50	50	100	PE
21EE22	Totally Integrated Automation	3	0	0	3	50	50	100	PE

21EE23	Industrial Drives for Automation	3	0	0	3	50	50	100	PE
21EE24	Computer Architecture and Parallel Processing	3	0	0	3	50	50	100	PE
21EE25	Python for Embedded Systems	3	0	0	3	50	50	100	PE
21EE26	Artificial Intelligence	3	0	0	3	50	50	100	PE
21EE27	Multi-core Embedded Systems	3	0	0	3	50	50	100	PE
21EE28	Robotic Process Automation	3	0	0	3	50	50	100	PE
21EE29	Advanced Embedded Controllers	3	0	0	3	50	50	100	PE
21EE30	Blockchain Technology	3	0	0	3	50	50	100	PE
21EE31	Automotive Embedded Systems	3	0	0	3	50	50	100	PE
21EE32	Automotive Software Architecture	3	0	0	3	50	50	100	PE
21EE33	Graphical Programming for Real-Time Applications	3	0	0	3	50	50	100	PE
21EE34	Industrial Networking and Standards	3	0	0	3	50	50	100	PE
21EE35	Internetworking and its Applications	3	0	0	3	50	50	100	PE
21EE36	Wireless Sensor Networks	3	0	0	3	50	50	100	PE
21EE37	Wireless and Mobile Communication	3	0	0	3	50	50	100	PE
21EE38	Cryptography and Network Security	3	0	0	3	50	50	100	PE
21EE39	Advanced Digital Signal Processing	3	0	0	3	50	50	100	PE
21EE40	Computer Vision	3	0	0	3	50	50	100	PE
21EE41	Graph Theory and Applications	3	0	0	3	50	50	100	PE
21EE42	Optimization Techniques	3	0	0	3	50	50	100	PE
21EE43	Digital Controllers for Power Electronics	3	0	0	3	50	50	100	PE
21EE44	Smart Grid Technologies	3	0	0	3	50	50	100	PE
21EE45	Soft Computing	3	0	0	3	50	50	100	PE
21EE46	Machine Learning and its Applications	3	0	0	3	50	50	100	PE
21EE47	E-Mobility	3	0	0	3	50	50	100	PE
<b>OPEN ELECTIVE THEORY COURSES (One to be opted)</b>									
21EE91	Business Analytics	3	0	0	3	50	50	100	OE
21EE92	Electronic Waste Management	3	0	0	3	50	50	100	OE
21EE93	Industrial Safety and Standards	3	0	0	3	50	50	100	OE
21EE94	Innovation and Product Development	3	0	0	3	50	50	100	OE

\* Indicated is the minimum number of credits to be earned by a student.

**CAT – Category; PC – Professional Core; PE - Professional Elective, EEC – Employability Enhancement Course; MC - Mandatory Course; RMC – Research Methodology Course; Grade – Completed / Not Completed; OE – Open Elective**