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**PERIYAR
MANIAMMAI**
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
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Faculty of Engineering and Technology

Department of Electronics and Communication Engineering

**B.Tech. Electronics and Communication Engineering
with Specialization in Robotics & Industrial Automation**

Curriculum Regulations 2024

**PERIYAR MANIAMMAI INSTITUTE OF SCIENCE &
TECHNOLOGY**

Vallam, Thanjavur – 613 403

PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
B.Tech. Electronics and Communication Engineering with Specialization in
Robotics and Industrial Automation
CURRICULUM – REGULATIONS 2024

Category of courses and minimum credit requirement for B.Tech. Electronics and Communication Engineering with Specialization in Robotics and Industrial Automation programme as per Regulations 2024 are outlined below:

Sl. No.	Category of Courses	Credits
1.	Foundation Courses (Humanities and Social Sciences including Management Courses, Basic Science and Engineering Science Courses)	60
2.	Professional Core Courses	60
3.	Professional Elective Courses	18
4.	Open Elective Courses	09
5.	Online Courses	06
6.	Employability Enhancement Courses (Value-added, Community Engagement and Social Responsibility, Skill Development Courses, Soft and Managerial Skills, Internship, Mini-projects, and Capstone project)	27
7.	Audit Courses*	---
8.	Courses Lead to Specialization / Minor / Honours	20
	Total Credits	200

***Note:** Audit Courses such as Life Science, Environmental Science, Indian History etc., shall be introduced as they mandate the requirement of Outcome Based Education.

SEMESTER I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EN101	Technical English	3	0	0	3
2	U24MA101	Matrices and Differential Calculus	3	1	0	4
3	U24CH151	Engineering Chemistry	3	0	0	3
4	U24GE101	Principles of Engineering	3	0	0	3
5	U24GE152	Engineering Graphics	2	1	0	3
6	U24EM101	Coding Techniques	3	0	0	3
Practical						
7	U24MA102	Mathematics Laboratory	0	0	2	1
8	U24CH152	Engineering Chemistry Laboratory	0	0	2	1
9	U24EM102	Coding Techniques Laboratory	0	0	2	1
Total			17	2	6	22

SEMESTER II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EN151	Technical Communication Skill Development	2	0	2	3
2	U24MA151	Vector Calculus and Laplace Transforms	3	1	0	4
3	U24PH101	Engineering Physics	3	0	0	3
4	U24GE151	Design Thinking	3	0	0	3
5	U24GE102	Biology for Engineers	3	0	0	3
6	U24EM151	Programming in Practice	3	0	0	3
Practical						
7	U24PH102	Engineering Physics Laboratory	0	0	2	1
8	U24GE153	Design Thinking Laboratory	0	0	4	2
9	U24GE154	Engineering Practices	0	0	2	1
10	U24EM152	Programming in Practice Laboratory	0	0	2	1
Total			17	1	12	24

SEMESTER III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA202	Fourier Transforms and Partial Differential Equations	3	1	0	4
2	U24SH201	Universal Human Values	2	1	0	3
3	U24EC201	Digital System Design	3	0	0	3
4	U24EC202	Electronic Devices	3	0	0	3
5	U24EC203	Sensors and Actuators	3	0	2	4
6	U24EC204	Signals and Systems	3	1	0	4
Practical						
7	U24EC205	Digital System Design Laboratory	0	0	2	1
8	U24EC206	Electronic Devices Laboratory	0	0	2	1
Audit Course						
9	U24AUXXX	Audit Course - I	-	-	-	-
Courses Lead to Specialization / Minor / Honors						
10	U24EC601	Service Robotics	3	0	2	4
Total			20	3	8	27

SEMESTER IV

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA254	Probability Theory and Stochastic Processes	3	1	0	4
2	U24EC251	Analog Circuits	3	0	0	3
3	U24EC252	Digital Signal Processing	3	1	0	4
4	U24EC253	Electromagnetic Waves	3	0	0	3
5	U24EC254	Network Theory	3	0	0	3
6	U24EC751	Ancient Concepts and Applications in Engineering	3	0	0	3
Practical						
7	U24EC255	Analog Circuits Laboratory	0	0	2	1
8	U24EC256	Digital Signal Processing Laboratory	0	0	4	2
9	U24EM2XX	Internship / Practical Training / Value Added Course(s)	2	0	2	3
Audit Course						
10	U24AUXXX	Audit Course - II	-	-	-	-
Courses Lead to Specialization / Minor / Honors						
11	U24EC651	Industrial Robotics and Automation	3	0	2	4
Total			23	2	10	30

SEMESTER V

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24MA302	Numerical Techniques and Optimization	3	0	0	3
2	U24EC301	Communication Theory	3	0	0	3
3	U24EC302	Microprocessors and Microcontrollers	3	0	0	3
4	U24EC7XX	Open Elective - II	3	0	0	3
5	U24EC9XX	Professional Elective - I	3	0	0	3
6	U24EC9XX	Professional Elective - II	3	0	0	3
7	U24EM301	Value Added Course – Community Engagement and Social Responsibility	1	0	2	2
Practical						
8	U24EC303	Analog Communication Laboratory	0	0	2	1
9	U24EC304	Microprocessors and Microcontrollers Laboratory	0	0	4	2
Audit Course						
10	U24AUXXX	Audit Course - III	-	-	-	-
Courses Lead to Specialization / Minor / Honors						
11	U24EC602	Robot Operating System	3	0	2	4
Total			22	0	10	27

SEMESTER VI

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EC351	Antennas and Propagation	3	0	0	3
2	U24EC352	Control Systems	3	0	0	3
3	U24EC353	Digital Communication	3	0	0	3
4	U24EC7XX	Open Elective - III	3	0	0	3
5	U24EC8XX	Online Course - I	3	0	0	3
6	U24EC9XX	Professional Elective - III	3	0	0	3
7	U24EC9XX	Professional Elective - IV	3	0	0	3
Practical						
8	U24EC354	Digital Communication Laboratory	0	0	4	2
9	U24EM3XX	Skill Enhancement / Value Added Course(s)	1	0	2	2
Audit Course						
10	U24AUXXX	Audit Course - IV	-	-	-	-
Courses Lead to Specialization / Minor / Honors						
11	U24EC652	Computer Vision	3	0	2	4
Total			25	0	8	29

SEMESTER VII

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24GE401	Professional Ethics	3	0	0	3
2	U24EC401	Embedded Systems	3	0	0	3
3	U24EC402	Microwave Engineering	3	0	0	3
4	U24EC403	VLSI Design	3	0	0	3
5	U24EC9XX	Professional Elective - V	3	0	0	3
6	U24EC9XX	Professional Elective - VI	3	0	0	3
Practical						
7	U24EC404	Microwave Engineering Laboratory	0	0	4	2
8	U24EC405	VLSI Design and Embedded Systems Laboratory	0	0	4	2
9	U24EM401	Project Phase - I	0	0	8	4
Courses Lead to Specialization / Minor / Honors						
10	U24EC603	Deep Learning	3	0	2	4
Total			21	0	18	30

SEMESTER VIII

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24EC8XX	Online Course - II	3	0	0	3
Practical						
2	U24EM451	Project Phase - II	0	0	16	8
Total			3	0	16	11

The number of credits in each semester is summarized as follows:

Programme	I	II	III	IV	V	VI	VII	VIII
B.Tech. Electronics and Communication Engineering with Specialization in Robotics and Industrial Automation	22	24	27	30	27	29	30	11

Semester wise Credit Distribution (in all categories of courses)

Sl. No.	Category of Courses	Credits	I	II	III	IV	V	VI	VII	VIII
1.	Foundation Courses	55	18	20	7	4	3	-	3	-
2.	Professional Core Courses	65	-	-	16	16	9	11	13	-
3.	Professional Elective Courses	18	-	-	-	-	6	6	6	-
4.	Open Elective Courses	9	-	-	-	3	3	3	-	-
5.	Employability Enhancement Courses	27	4	4	-	3	2	2	4	8
6.	Online Courses	6	-	-	-	-	-	3	-	3
7.	Audit Courses	--	-	-	-	-	-	-	-	-
8.	Courses Lead to Specialization / Minor / Honors	20	-	-	4	4	4	4	4	-
Total		200	22	24	27	30	27	29	30	11

Suggested List of Professional Elective Courses

Professional Elective – I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC901	High Speed Electronics	3	0	0	3
2	U24EC902	Computer Organization and Architecture	3	0	0	3
3	U24EC903	Fundamentals of MEMS	3	0	0	3
4	U24EC904	Bio Signal Processing	3	0	0	3
5	U24EC905	Cloud Computing	3	0	0	3

Professional Elective – II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC906	Biomedical Electronics	3	0	0	3
2	U24EC907	Data Structures	3	0	0	3
3	U24EC908	Nano Electronics	3	0	0	3
4	U24EC909	Speech Processing	3	0	0	3
5	U24EC910	Smart Grid	3	0	0	3

Professional Elective – III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC951	Power Electronics for Electric Vehicle	3	0	0	3
2	U24EC952	Operating Systems	3	0	0	3
3	U24EC953	Satellite Communication	3	0	0	3
4	U24EC954	Computer Networks	3	0	0	3
5	U24EC955	Block Chain Technologies	3	0	0	3

Professional Elective – IV

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC956	MEMS for Wireless Communication	3	0	0	3
2	U24EC957	Data Science Essentials	3	0	0	3
3	U24EC958	Wireless Communications	3	0	0	3
4	U24EC959	Digital Image Processing	3	0	0	3
5	U24EC960	Prompt Engineering	3	0	0	3

Professional Elective – V

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC911	Quantum and Photonic Technology	3	0	0	3
2	U24EC912	Fundamentals of Kotlin Programming	3	0	0	3
3	U24EC913	Fundamentals of 5G Technologies	3	0	0	3
4	U24EC914	Software-Defined Wide Area Networking (SD-WAN)	3	0	0	3
5	U24EC915	Digital Twin	3	0	0	3

Professional Elective – VI

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC916	Fiber Optic Communication	3	0	0	3
2	U24EC917	Edge Computing	3	0	0	3
3	U24EC918	MIMO Communication	3	0	0	3
4	U24EC919	Information theory and Coding	3	0	0	3
5	U24EC920	Generative AI Models	3	0	0	3

List of Courses under each Category

Foundation Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Humanities & Social Sciences including Management Courses						
1	U24EN101	Technical English	3	0	0	3
2	U24EN151	Technical Communication Skill Development	2	0	2	3
3	U24SH201	Universal Human Values	2	1	0	3
Basic Science Courses						
4	U24MA101	Matrices and Differential Calculus	3	1	0	4
5	U24PH101	Engineering Physics	3	0	0	3
6	U24MA102	Mathematics Laboratory	0	0	2	1
7	U24PH102	Engineering Physics Laboratory	0	0	2	1
8	U24MA151	Vector Calculus and Laplace Transforms	3	1	0	4
9	U24CH151	Engineering Chemistry	3	0	0	3
10	U24CH152	Engineering Chemistry Laboratory	0	0	2	1
11	U24MA202	Fourier Transforms and Partial Differential Equations	3	1	0	4
12	U24MA254	Probability Theory and Stochastic Processes	3	1	0	4
13	U24MA304	Numerical Techniques and Optimization	3	0	0	3
Engineering Science Courses						
14	U24GE101	Principles of Engineering	3	0	0	3
15	U24GE102	Biology for Engineers	3	0	0	3
16	U24GE151	Design Thinking	3	0	0	3
17	U24GE152	Engineering Graphics	2	1	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
18	U24GE153	Design Thinking Laboratory	0	0	4	2
19	U24GE154	Engineering Practices	0	0	2	1
20	U24GE401	Professional Ethics	3	0	0	3
Total			42	6	14	55

Professional Core Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC201	Digital System Design	3	0	0	3
2	U24EC202	Electronic Devices	3	0	0	3
3	U24EC203	Sensors and Actuators	3	0	2	4
4	U24EC204	Signals and Systems	3	1	0	4
5	U24EC205	Digital System Design Laboratory	0	0	2	1
6	U24EC206	Electronic Devices Laboratory	0	0	2	1
7	U24EC251	Analog Circuits	3	0	0	3
8	U24EC252	Digital Signal Processing	3	1	0	4
9	U24EC253	Electromagnetic Waves	3	0	0	3
10	U24EC254	Network Theory	3	0	0	3
11	U24EC255	Analog Circuits Laboratory	0	0	2	1
12	U24EC256	Digital Signal Processing Laboratory	0	0	4	2
13	U24EC301	Communication Theory	3	0	0	3
14	U24EC302	Microprocessors and Microcontrollers	3	0	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
15	U24EC303	Analog Communication Laboratory	0	0	2	1
16	U24EC304	Microprocessors and Microcontrollers Laboratory	0	0	4	2
17	U24EC351	Antennas and Propagation	3	0	0	3
18	U24EC352	Control Systems	3	0	0	3
19	U24EC353	Digital Communication	3	0	0	3
20	U24EC354	Digital Communication Laboratory	0	0	4	2
21	U24EC401	Embedded Systems	3	0	0	3
22	U24EC402	Microwave Engineering	3	0	0	3
23	U24EC403	VLSI Design	3	0	0	3
24	U24EC404	Microwave Engineering Laboratory	0	0	4	2
25	U24EC405	VLSI Design & Embedded Systems Laboratory	0	0	4	2
Total			48	2	32	65

Professional Elective Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC9XX	Professional Elective - I	3	0	0	3
2	U24EC9XX	Professional Elective - II	3	0	0	3
3	U24EC9XX	Professional Elective - III	3	0	0	3
4	U24EC9XX	Professional Elective - IV	3	0	0	3
5	U24EC9XX	Professional Elective - V	3	0	0	3
6	U24EC9XX	Professional Elective - VI	3	0	0	3
Total			18	0	0	18

Open Elective Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC751	Ancient Concepts and Applications in Engineering	3	0	0	3
2	U24EC7XX	Open Elective - II	3	0	0	3
3	U24EC7XX	Open Elective - III	3	0	0	3
Total			9	0	0	9

Employability Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM101	Coding Techniques	3	0	0	3
2	U24EM102	Coding Techniques Laboratory	0	0	2	1
3	U24EM151	Programming in Practice	3	0	0	3
4	U24EM152	Programming in Practice Laboratory	0	0	2	1
5	U24EM2XX	Internship / Practical Training / Value Added Course(s)	2	0	2	3
6	U24EM301	Value Added Course – Community Engagement and Social Responsibility	1	0	2	2
7	U24EM3XX	Skill Development / Value Added Course(s)	1	0	2	2
8	U24EM401	Project Phase – I	0	0	8	4
9	U24EM451	Project Phase – II	0	0	16	8
Total			10	0	34	27

Online Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EC8XX	Online Course – I	3	0	0	3
2	U24EC8XX	Online Course – II	3	0	0	3
Total			6	0	0	6

Audit Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24AUXXX	Audit Course – I	-	-	-	-
2	U24AUXXX	Audit Course – II	-	-	-	-
3	U24AUXXX	Audit Course – III	-	-	-	-
4	U24AUXXX	Audit Course – IV	-	-	-	-
Total			-	-	-	-

Suggested list of Audit Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24AU001	Disaster Management	-	-	-	-
2	U24AU003	Cyber Security	-	-	-	-
3	U24AU007	Environmental Studies	-	-	-	-
4	U24AU008	Entrepreneurship Development	-	-	-	-
5	U24AU009	Constitution of India	-	-	-	-

Courses Lead to Specialization / Minor / Honors

Sl.No.	Semester	Course Code	Course Name	Credits			
				L	T	P	C
1	III	U24EC601	Service Robotics	3	0	2	4
2	IV	U24EC651	Industrial Robotics and Automation	3	0	2	4
3	V	U24EC602	Robot Operating System	3	0	2	4
4	VI	U24EC652	Computer Vision	3	0	2	4
5	VII	U24EC603	Deep Learning	3	0	2	4
Total				15	0	10	20