ACADEMIC CURRICULA

UNDERGRADUATE/ INTEGRATED POST GRADUATE DEGREE PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

(Revised on July 2024)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

33. B.Tech. in Electronics and Communication Engineering with Specialization in Data Science

33. (a) Mission of the Department

Mission Stmt – 1	*Build an educational process that is well suited to local needs as well as satisfies the national and international accreditation requirements.*
Mission Stmt – 2	*Attract the qualified professionals and retain them by building an environment that fosters work freedom and empowerment.*
Mission Stmt – 3	*With the right talent pool, create knowledge and disseminate, get involved in collaborative research with reputed universities and produce competent graduands.*

33. (b) Program Educational Objectives (PEO)

PEO – 1	*Apply the acquired knowledge and skills in solving real-world engineering problems, considering national/global and societal issues such as health, environment, and safety.*
PEO – 2	*Design data analytics model for optimized solutions, which are economically feasible and socially relevant.*
PEO – 3	*Develop an attitude toward pursuing knowledge and advanced education for sustained career advancement to adapt to emerging fields.*
PEO – 4	*Demonstrate leadership qualities and effective communication skills to work in a team of enterprising people in a multidisciplinary and multicultural environment with strong adherence to professional ethics.*

33. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	1	2	3
PEO - 2	3	3	3
PEO - 3	2	1	3
PEO - 4	3	3	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

33. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12			
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
PEO - 1	3	3	-	-	-	3	3	2	-	-	-	-	3	-	-
PEO - 2	-	-	3	3	3	3	-	-	2	-	3	-	-	3	-
PEO - 3	-	-	-	3	3	-	2	2	-	2	-	3	-	2	3
PEO - 4	-	-	-	-	-	-	-	3	3	3	3	-	-	-	3

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Problem Solving Skills: Should be able to identify and deploy data science and engineering components and provide efficient solutions in solving real-world problems in medicine, science, industry, and numerous other fields.*
PSO - 2	*Professional Skills: Should be able to develop new tools and methods in data collection, integration, cleansing, and representation for real-time data processing.*
PSO - 3	*Successful Career and Entrepreneurship: Create technologically innovative products, Interpret / analyze multi-disciplinary data and propose optimal solution through data analytics.*

33. (e) Program Structure: B.Tech. in Electronics and Communication Engineering with Specialization in Data Science

Humanities & Social Sciences including Management Courses (H)					
Course Code	Course Title	L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese	2	1	0	3
21LEH106T	Korean				
21LEH107T	Spanish				
21LEH108T	Russian				
21GNH101J	Philosophy of Engineering	1	0	2	2
21PDH209T [1]	Social Engineering	2	0	0	2
21GNH401T	Behavioral Psychology	2	1	0	3
	Total Credits				**13**

Basic Science Courses (B)					
Course Code	Course Title	L	T	P	C
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
21CYB101J	Chemistry	3	1	2	5
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21MAB203T	Probability and Stochastic Processes	3	1	0	4
21MAB302T	Discrete Mathematics	3	1	0	4
21BTB103T	Biology	2	0	0	2
	Total Credits				**32**

Engineering Science Courses (S)					
Course Code	Course Title	L	T	P	C
21MES101L [1]	Basic Civil and Mechanical Workshop	0	0	4	2
21MES102L [1]	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CSS101J	Programming for Problem Solving	3	0	2	4
21CSS201T	Computer Organization and Architecture	3	1	0	4
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21CSS303T	Data Science	2	0	0	2
	Total Credits				**21**

Professional Core Courses (C)					
Course Code	Course Title	L	T	P	C
21ECC101J	Electronic System and PCB Design	2	0	2	3
21ECC201T [2]	Solid State Devices	3	0	0	3
21ECC202T	Analog and Linear Electronic Circuits	3	0	0	3
21ECC203T	Digital Logic Design	3	0	0	3
21ECC204T [2]	Signal Processing	3	0	0	3
21ECC205T	Electromagnetic Theory and Interference	3	0	0	3
21ECC211L [1]	Devices and Digital IC Laboratory	0	0	4	2
21ECC222L [1]	Analog and Linear Electronic Circuits Laboratory	0	0	4	2
21ECC301P [1]	Microprocessor, Microcontroller, and Interfacing Techniques	3	1	0	4
21ECC302T	Analog and Digital Communication	3	0	0	3
21ECC303T [2]	VLSI Design and Technology	3	0	0	3
21ECC304T [2]	Microwave and Optical Communication	3	0	0	3
21ECC311L [1]	VLSI Design Laboratory	0	0	4	2
21ECC322L [1]	Communication Laboratory	0	0	4	2
21ECC401T [2]	Wireless Communication and Antenna Systems	3	0	0	3
21ECC402P [1]	Computer Communication and Network Security	2	1	0	3
21CSC206T	Artificial Intelligence	2	1	0	3
	Total Credits				**48**

Non Credit Courses (M)					
Course Code	Course Title	L	T	P	C
21PDM101L [1]	Professional Skills and Practices	0	0	2	
21PDM102L [1]	General Aptitude	0	0	2	
21PDM201L [1]	Verbal Reasoning	0	0	2	
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
21PDM301L [1]	Analytical and Logical Thinking Skills	0	0	2	
21PDM302L [1]	Employability Skills and Practices	0	0	2	
21CYM101T [1]	Environmental Science	1	0	0	0
21LEM101T [1]	Constitution of India	1	0	0	0
21LEM102T [1]	Universal Human Values – Introduction	1	0	0	0
21LEM201T [1]	Professional Ethics	1	0	0	0
21LEM202T [1]	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
21LEM301T [1]	Indian Art Form	1	0	0	0
21LEM302T [1]	Indian Traditional Knowledge	1	0	0	0
21GNM101L [1]	Physical and Mental Health using Yoga				
21GNM102L [1]	National Service Scheme	0	0	2	0
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
	Total Credits				**03**

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)					
Course Code	Course Title	L	T	P	C

Open Elective Courses (O) (Any 3 courses)					
Course Code	Course Title	L	T	P	C
21ECO101T	Short Range Wireless Communication	3	0	0	3
21ECO102J	Electronic Circuits and Systems	2	0	2	3
21ECO103T	Modern Wireless Communication Systems	3	0	0	3
21ECO104J	PCB Design and Manufacturing	2	0	2	3
21ECO105T	Fiber Optics and Optoelectronics	3	0	0	3
21ECO106J	Embedded System Design using Arduino	2	0	2	3
21ECO107J	Embedded System Design using Raspberry Pi	2	0	2	3
21ECO108J	3D Printing Hardware and Software	2	0	2	3
21ECO109T	5G Technology – An Overview	3	0	0	3
	Total Credits				**09**

		L	T	P	C
21GNP301L [1]	Community Connect	0	0	2	1
21ECP302L [1]	Project	0	0	6	3
21ECP303T [1]	MOOC	3	0	0	
21ECP401L	Major Project	0	0	30	15
21ECP402L	Major Project	0	0	20	10
21ECP403L	Internship#	0	0	10	5
				Total Credits	**19**

Professional Elective Courses (E) *(Any 6 Courses)*					
Course Code	Course Title	L	T	P	C
21ECE270T	Statistics for Data Science	3	0	0	3
21ECE271T	Regression and Multivariate Data Analysis	3	0	0	3
21ECE272T	Data Analytics Using SAS	3	0	0	3
21ECE273T	Python for Data Sciences	3	0	0	3
21ECE274T	Machine learning for Data Analytics	3	0	0	3
21ECE275T	Tableau for Business Intelligence	3	0	0	3
21ECE322T	Data Analytics using R	3	0	0	3
21ECE370T	Block Chain in Data Analytics	3	0	0	3
21ECE371T	Database Design and Management	3	0	0	3
21ECE372T	Deep Learning for Data Analytics	3	0	0	3
21ECE373T	Julia For Data Science	3	0	0	3
21ECE374T	Data Pattern and Visualization	3	0	0	3
21ECE375T	Data Science for Communication Networks	3	0	0	3
21ECE376T	Business Data Analytics	3	0	0	3

Professional Elective Courses (E)					
Course Code	Course Title	L	T	P	C
21ECE377T	Big Data Analytics Strategies for the Smart Grid	3	0	0	3
21ECE470T	Cloud and Distributed Computing for Data Analytics	3	0	0	3
21ECE471T	Data Mining Techniques	3	0	0	3
21ECE472T	Social Media Data Analytics	3	0	0	3
21ECE473T	Data Science for IoT Engineers: A Systems Analytics Approach Media Analytics	3	0	0	3
21ECE474T	Big Data Analytics Tools	3	0	0	3
21ECE475T	Tools for Real-time Data Processing and Analytics	3	0	0	3
21ECE476T	Data Analytics with Spark Using Python	3	0	0	3
21ECE477T	Big Data and Health Care Analytics	3	0	0	3
				Total Credits	**18**

33. (f) Programme Articulation: B.Tech. in Electronics and Communication Engineering with Specialization in Data Science

Course Code	Course Name	Engineering Knowledge (1)	Problem Analysis (2)	Design/development of solutions (3)	Conduct investigations of complex problems (4)	Modern Tool Usage (5)	The engineer and society (6)	Environment & Sustainability (7)	Ethics (8)	Individual & Team Work (9)	Communication (10)	Project Mgt. & Finance (11)	Life Long Learning (12)	PSO-1	PSO-2	PSO-3
21ECC101J	Electronic System and PCB Design	2	-	3	2	3	-	-	-	-	-	-	-	-	-	-
21ECC201T	Solid State Devices	3	3	-	-	3	-	-	-	3	2	-	2	1	1	-
21ECC202T	Analog and Linear Electronic Circuits	3	2	3	-	-	-	-	-	-	-	-	-	1	-	2
21ECC203T	Digital Logic Design	3	2	3	-	3	-	-	-	-	-	-	-	1	-	2
21ECC204T	Signal Processing	3	2	3	-	-	-	-	-	-	-	-	-	2	1	3
21ECC205T	Electromagnetic Theory and Interference	2	3	-	-	-	-	-	-	-	-	-	1	-	-	2
21ECC211L	Devices and Digital IC Laboratory	3	2	3	-	3	-	-	-	-	-	-	-	1	-	2
21ECC222L	Analog and Linear Electronic Circuits Laboratory	3	2	3	-	-	-	-	-	-	-	-	-	1	-	2
21ECC301P	Microprocessor, Microcontroller, and Interfacing Techniques	-	2	3	-	3	-	-	-	-	-	-	2	1	-	2
21ECC302T	Analog and Digital Communication	3	2	3	3	2	-	-	-	-	-	-	-	2	2	3
21ECC303T	VLSI Design and Technology	3	2	3	-	3	-	-	-	-	-	-	-	2	-	2
21ECC304T	Microwave and Optical Communication	3	3	3	2	3	-	-	-	-	-	-	-	2	-	2
21ECC311L	VLSI Design Laboratory	3	2	3	-	3	-	-	-	-	-	-	-	2	-	2
21ECC322L	Communication Laboratory	3	2	3	3	2	-	-	-	-	-	-	-	2	2	3
21ECC401T	Wireless Communication and Antenna Systems	3	3	3	3	-	2	2	-	-	-	-	2	2	-	3
21ECC402P	Computer Communication and Network Security	-	-	2	-	1	1	2	-	-	-	-	2	-	-	3
21ECE270T	Statistics for Data Science	1	3	-	-	3	-	-	-	-	-	-	-	3	2	-
21ECE271T	Regression and Multivariate Data Analysis	2	3	-	3	3	-	-	-	-	-	-	-	3	2	-
21ECE272T	Data Analytics Using SAS	1	2	-	-	3	-	-	-	-	-	-	-	3	2	-
21ECE273T	Python for Data Sciences	2	1	-	-	3	-	-	-	-	-	-	-	2	3	-
21ECE274T	Machine learning for data analytics	3	3	-	2	3	-	-	-	-	-	-	-	2	3	-
21ECE275T	Tableau for Business Intelligence	1	2	-	-	3	-	-	-	-	-	-	-	1	3	-
21ECE322T	Data analytics using R	2	2	-	-	3	-	-	-	-	-	-	-	1	3	-
21ECE370T	Block chain in Data Analytics	3	1	-	-	3	-	-	-	-	-	-	-	-	3	-
21ECE371T	Database Design and Management	3	-	2	-	3	-	-	-	-	-	-	-	-	3	-
21ECE372T	Deep Learning for Data Analytics	3	3	-	2	3	-	-	-	-	-	-	-	2	3	-
21ECE373T	Julia For Data Science	2	2	-	-	3	-	-	-	-	-	-	-	1	3	-
21ECE374T	Data Pattern and Visualization	2	3	-	-	3	-	-	-	-	-	-	-	2	3	-
21ECE375T	Data Science for Communication Networks	3	2	-	-	3	-	-	-	-	-	-	-	2	3	-
21ECE376T	Business data analytics	2	2	-	-	3	-	-	-	-	-	-	-	3	3	-
21ECE377T	Big Data Analytics Strategies for the Smart Grid	3	2	-	2	3	-	-	-	-	-	-	-	2	2	-
21ECE470T	Cloud and Distributed Computing for data analytics	2	-	2	-	3	-	-	-	-	-	-	-	-	3	-
21ECE471T	Data Mining Techniques	2	2	-	-	3	-	-	-	-	-	-	-	2	3	-
21ECE472T	Social Media Data Analytics	1	3	-	-	3	1	-	-	-	-	-	-	2	1	-
21ECE473T	Data Science for IoT Engineers: A Systems Analytics Approach Media Analytics	3	2	-	1	3	-	-	-	-	-	-	-	2	2	-
21ECE474T	Big Data analytics tools	2	-	-	3	3	-	-	-	-	-	-	-	2	3	-
21ECE475T	Tools for Real-time Data Processing and Analytics	2	-	-	2	3	-	-	-	-	-	-	-	-	3	-
21ECE476T	Data Analytics with Spark Using Python	3	-	-	2	3	-	-	-	-	-	-	-	2	3	-
21ECE477T	Big Data and Health care Analytics	3	-	-	2	3	-	-	-	-	-	-	-	1	3	-
21GNP301L	Community Connect						3			3	3	2				
21ECP302L	Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21ECP303T	MOOC	3	2											3		
21ECP401L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21ECP402L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21ECP403L	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Program Average	2.47	2.26	2.81	2.29	2.88	2	2	-	3	2	-	1.8	1.81	2.52	2.36

33. (g) Implementation Plan: B.Tech. in Electronics and Communication Engineering with Specialization in Data Science

Semester – I

Course Code	Course Title	L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
21MES102L [1]	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CYM101T [1]	Environmental Science	1	0	0	0
21PDM101L [1]	Professional Skills and Practices	0	0	2	0
21LEM101T [1]	Constitution of India	1	0	0	0
	Total Credits				**18**

Semester – II

Course Code	Course Title	L	T	P	C
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese	2	1	0	3
21LEH106T	Korean				
21LEH107T	Spanish				
21LEH108T	Russian				
21GNH101J	Philosophy of Engineering	1	0	2	2
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21CYB101J	Chemistry	3	1	2	5
21ECC101J	Electronic System and PCB Design	2	0	2	3
21CSS101J	Programming for Problem Solving	3	0	2	4
21BTB103T	Biology	2	0	0	2
21MES101L [1]	Basic Civil and Mechanical Workshop	0	0	4	2
21PDM102L [1]	General Aptitude	0	0	2	0
21GNM101L [1]	Physical and Mental Health using Yoga				
21GNM102L [1]	National Service Scheme				
21GNM103L [1]	National Cadet Corps	0	0	2	0
21GNM104L [1]	National Sports Organization				
	Total Credits				**25**

Semester – III

Course Code	Course Title	L	T	P	C
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21PDH209T [1]	Social Engineering	2	0	0	2
21CSS201T	Computer Organization and Architecture	3	1	0	4
21ECC201T [2]	Solid State Devices	3	0	0	3
21ECC203T	Digital Logic Design	3	0	0	3
21ECC205T	Electromagnetic Theory and Interference	3	0	0	3
21ECC211L [1]	Devices and Digital IC Laboratory	0	0	4	2
21LEM201T [1]	Professional Ethics	1	0	0	0
21PDM201L [1]	Verbal Reasoning	0	0	2	0
21LEM202T [1]	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
	Total Credits				**24**

Semester – IV

Course Code	Course Title	L	T	P	C
21MAB203T	Probability and Stochastic Processes	3	1	0	4
21ECC202T	Analog and Linear Electronic Circuits	3	0	0	3
21ECC204T [2]	Signal Processing	3	0	0	3
21ECC222L [1]	Analog and Linear Electronic Circuits Laboratory	0	0	4	2
21CSC206T	Artificial Intelligence	2	1	0	3
E	Professional Elective-I				3
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
	Total Credits				**21**

Semester – V

Course Code	Course Title	L	T	P	C
21MAB302T	Discrete Mathematics	3	1	0	4
21ECC301P [1]	Microprocessor, Microcontroller, and Interfacing Techniques	3	1	0	4
21ECC303T [2]	VLSI Design and Technology	3	0	0	3
21ECC311L [1]	VLSI Design Laboratory	0	0	4	2
E	Professional Elective – II				3
O	Open Elective – I				3
21GNP301L [1]	Community Connect	0	0	2	1
21PDM301L [1]	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T [1]	Indian Art Form	1	0	0	0
	Total Credits				**20**

Semester – VI

Course Code	Course Title	L	T	P	C
21CSS303T	Data Science	2	0	0	2
21ECC302T	Analog and Digital Communication	3	0	0	3
21ECC304T [2]	Microwave and Optical Communication	3	0	0	3
21ECC322L [1]	Communication Laboratory	0	0	4	2
E	Professional Elective – III				3
E	Professional Elective – IV				3
O	Open Elective – II				3
21ECP302L [1]	Project	0	0	6	3
21ECP303T [1]	MOOC	3	0	0	
21PDM302L [1]	Employability Skills and Practices	0	0	2	0
21LEM302T [1]	Indian Traditional Knowledge	1	0	0	0
	Total Credits				**22**

Semester – VII

Course Code	Course Title	L	T	P	C
21GNH401T	Behavioral Psychology	2	1	0	3
21ECC401T [2]	Wireless Communication and Antenna Systems	3	0	0	3
21ECC402P [1]	Computer Communication and Network Security	2	1	0	3
E	Professional Elective – V				3
E	Professional Elective – VI				3
O	Open Elective –III				3
	Total Credits				**18**

#Students have to register either 21ECP401L or 21ECP402L and 21ECP403L both in eighth semester

Semester - VIII

Course Code	Course Title	L	T	P	C
21ECP401L	Major Project	0	0	30	15
21ECP402L	Major Project	0	0	20	10
21ECP403L	Internship#	0	0	10	5
	Total Credits				**15**

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India