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

32. B.Tech. in Electronics and Communication Engineering with Specialization in Cyber Physical System

32. (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.*

32. (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 Intelligent systems, which are economically feasible and socially relevant for smart control and computing.*
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.*

32. (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

32. (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 understand and explain cyber-physical system component architectures and their implementation in a wide range of domains such as transportation, defense, energy and industrial automation, health and biomedical, agricultural and critical infrastructure.*
PSO - 2	*Professional skills: Should be able to analyze existing cyber-physical systems and to evaluate the security of cyber-physical systems according to industry recognized security frameworks and present findings and recommendations.*
PSO - 3	*Successful Career and Entrepreneurship: Should be able to explain how the interdisciplinary fields such as Information Technology, Electrical & Computer Engineering, Mechanical Engineering, and Cybersecurity relate to cyber-physical systems.*

32. (e) Program Structure: B.Tech. in Electronics and Communication Engineering with Specialization in Cyber Physical System

Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	Hours / Week L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21LEH102T	Chinese	2	1	0	3
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese				
21LEH106T	Korean				
21LEH107T	Spanish				
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	Hours / Week 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	Hours / Week 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**

Open Elective Courses (O)
(Any 3 courses)

Course Code	Course Title	Hours / Week 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**

Non Credit Courses (M)

Course Code	Course Title	Hours / Week L	T	P	C
21PDM101L [1]	Professional Skills and Practices	0	0	2	0
21PDM102L [1]	General Aptitude	0	0	2	
21PDM201L [1]	Verbal Reasoning	0	0	2	
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	
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	0	0	2	0
21GNM102L [1]	National Service Scheme				
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
				Total Credits	**03**

Professional Core Courses (C)

Course Code	Course Title	Hours / Week 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**

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)

Course Code	Course Title	Hours / Week 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	Hours / Week			
		L	T	P	C
21ECE250J	*Sensors and Actuators for Cyber Physical System*	*2*	*0*	*2*	*3*
21ECE251T	*Embedded and Implanted Devices for Cyber Physical System*	*3*	*0*	*0*	*3*
21ECE304T	*Cyber Physical System Framework*	*3*	*0*	*0*	*3*
21ECE323T	*Cyber Security*	*3*	*0*	*0*	*3*
21ECE252J	*Cyber Physical Control System*	*2*	*0*	*2*	*3*
21ECE350T	*Real Time Cyber Physical System*	*3*	*0*	*0*	*3*
21ECE351T	*Unsupervised Intelligence in Cyber Physical System*	*3*	*0*	*0*	*3*

Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week			
		L	T	P	C
21ECE352T	*High Performance Computing for Cyber Physical System*	*3*	*0*	*0*	*3*
21ECE450T	*Design of Cyber Physical System*	*3*	*0*	*0*	*3*
21ECE451T	*Cyber Physical Interface and Automation*	*3*	*0*	*0*	*3*
21ECE452T	*Cloud and Distributed Systems for Cyber Physical System*	*3*	*0*	*0*	*3*
21ECE453T	*Mobile Cyber Physical System*	*3*	*0*	*0*	*3*
				Total Credits	**18**

32. (f) Programme Articulation: B.Tech. in Electronics and Communication Engineering with Specialization in Cyber Physical System

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
		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
21ECC101J	Electronic System and PCB Design	3	2.5	2.67	-	3	-	-	-	-	-	2	-	2.8	2.5	-
21ECC201T	Solid State Devices	3	2	-	-	-	-	-	-	-	-	-	1	1	-	-
21ECC203T	Digital Logic Design	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
21ECC205T	Electromagnetic Theory and Interference	2.4	2.6	-	-		-	-	-	-	-	-	-	-	-	-
21ECC211L	Devices and Digital IC Laboratory	3	2	-	-	1	-	-	-	-	-	-		1	-	-
21ECC202T	Analog and Linear Electronic Circuits	2	2	3	-	-	-	-	-	-	-	-	-	-	-	3
21ECC204T	Signal Processing	2	2.2	3	3	-	-	-	-	-	-	-	-	-	-	2.2
21ECC222L	Analog and Linear Electronic Circuits Laboratory	2	-	2	-	3	-	-	-	-	-	-	-	-	-	-
21ECC301P	Microprocessor, Microcontroller, and Interfacing Techniques	-	3	3	-	3	-	-	-	-	-	-	-	2.67	-	-
21ECC303T	VLSI Design and Technology	-	2.4	2.25	-		-	-	-	-	-	-	-	2	2	-
21ECC311L	VLSI Design Laboratory	3	3	-	-	1	-	-	-	-	-	-	-	1	-	-
21ECC302T	Analog and Digital Communication	3	2.5	3	-	3	-	-	-	-	-	-	2	2.5	3	2.5
21ECC304T	Microwave and Optical Communication	2.8	2	2	3	-	-	-	-	-	-	-	-	3	2	-
21ECC322L	Communication Laboratory	2	-	2.5	3	-	-	-	-	-	3	-	-	3	2	-
21ECC401T	Wireless Communication and Antenna Systems	3	2.3	-	-	-	-	-	-	-	-	-	2	-	-	3
21ECC402P	Computer Communication and Network Security	2.67	3	2	-	-	-	-	-	-	-	-	-	-	-	3
21ECE250J	Sensors and Actuators for Cyber Physical System	3	2.5	3	3	3	-	2	-	-	-	-	2	3	3	2
21ECE251T	Embedded and Implanted Devices for Cyber Physical System	1	2	3	-	2	-	-	-	1	2	-	2	-	-	3
21ECE304T	Cyber Physical System Framework	3	2.2	3	-	3	-	-	-	3	-	-	-	-	-	-
21ECE323T	Cyber Security	-	3	3	-	-	-	-	-	-	-	-	-	3	-	-
21ECE252J	Cyber Physical Control System	3	2.67	2	-	-	-	-	-	-	-	-	-	-	-	-
21ECE350T	Real Time Cyber Physical System	-	-	3	-	-	-	3	-	-	-	-	2	-	3	-
21ECE351T	Unsupervised Intelligence in Cyber Physical System	3	2	3	-	3	-	-	-	-	-	-	-	-	-	-
21ECE352T	High Performance Computing for Cyber Physical System	3	2	3	-	1.67	-	-	-	-	-	-	-	-	-	-
21ECE450T	Design of Cyber Physical System	3	2.33	3	3	3	-	-	-	-	-	-	-	3	3	2
21ECE451T	Cyber Physical Interface and Automation	2	3	2	-	1	-	-	-	1.6	1	-	3	-	-	-
21ECE452T	Cloud and Distributed Systems for Cyber Physical System	2	3	2.6	-	-	2	-	-	-	-	2	-	-	-	-
21ECE453T	Mobile Cyber Physical System	2.2	2	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		2.59	2.41	2.65	3.00	2.41	2.00	2.50	-	1.87	2.00	2.00	2.00	2.38	2.56	2.59

32. (g) Implementation Plan: B.Tech. in Electronics and Communication Engineering with Specialization in Cyber Physical System

Semester – I

Course Code	Course Title	Hours / Week 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	Hours / Week L	T	P	C
21LEH102T	Chinese	2	1	0	3
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese				
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	0	0	2	0
21GNM102L [1]	National Service Scheme				
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
				Total Credits	**25**

Semester – III

Course Code	Course Title	Hours / Week 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	Hours / Week 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
21PDM202 [1]	Critical and Creative Thinking Skills	0	0	2	0
				Total Credits	**21**

Semester – V

Course Code	Course Title	Hours / Week 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	Hours / Week 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**

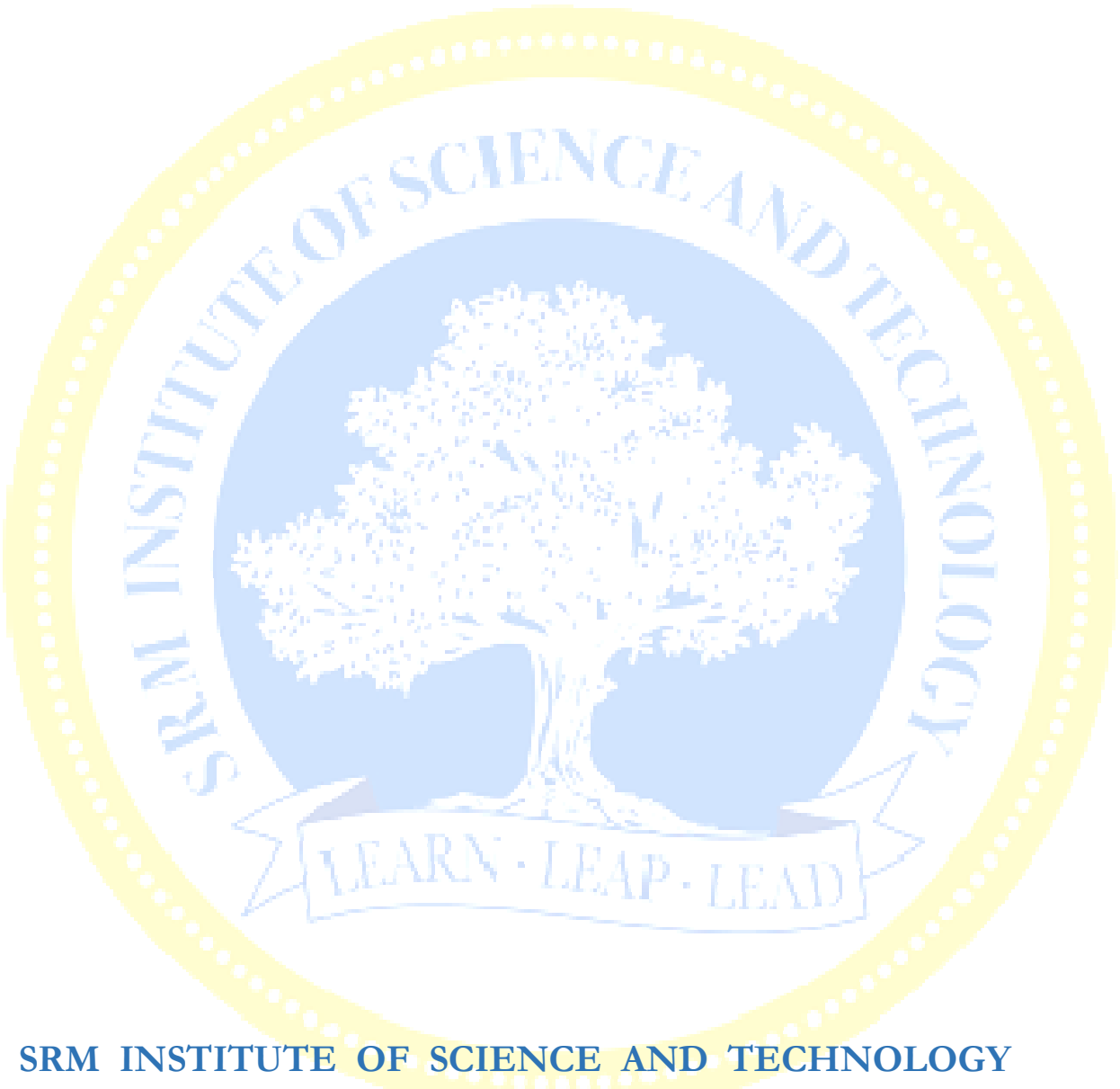
Semester – VII

Course Code	Course Title	Hours / Week 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**

Semester - VIII

Course Code	Course Title	Hours / Week 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**

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



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

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