ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMMES

Bachelor of Technology

(B.Tech. - Four Years)

(Choice Based Flexible Credit System)

Regulations 2018

Volume - 1

(Revised in March 2019)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India

23. B.Tech. in Electronics and Communication Engineering

23. (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 foster work freedom and empowerment*
Mission Stmt - 3	*With the right talent pool, create knowledge and disseminate, get involved in collaborative research with reputed institutes and produce competent graduands.*

23. (b) Program Educational Objectives (PEO)

The Program Educational Objectives for the Electronics and Communication Engineering program describe accomplishments that graduates are expected to attain within five years after graduation. Graduates within 5 years of graduation will/should demonstrate:

PEO – 1	Establish themselves as successful and creative practicing professional engineers, both nationally and globally, in the related fields of Electronics and Communication Engineering.
PEO – 2	Apply the acquired knowledge and the skills in solving real-world engineering problems; develop novel technology and design products which are socially relevant and economically feasible.
PEO – 3	Develop an attitude of sustained lifelong learning for career advancement and adapt to the changing multidisciplinary profession.
PEO – 4	Demonstrate leadership qualities, effective communication skills, and to work in a team of enterprising people in the multidisciplinary and multicultural environment with strong adherence to professional ethics.

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

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. – 3
PEO - 1	H	H	H
PEO - 2	L	M	H
PEO - 3	M	L	H
PEO - 4	H	H	H

H – High Correlation, M – Medium Correlation, L – Low Correlation

23. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes (PLO)

	Program Learning Outcomes (PLO)														
	Graduate Attributes (GA)												Program Specific Outcomes (PSO)		
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	Design, Prototype and Test Modern ECE Systems	Project Management Techniques	Implement ECE Systems
PEO - 1	M	H	M	H	H								H		M
PEO - 2	H	H	H	H	H		H	M		L	H		H	L	H
PEO - 3							M		H	M		H	L		
PEO - 4						H		H	H	H	H			H	L

H – High Correlation, M – Medium Correlation, L – Low Correlation

PSO – Program Specific Outcomes (PSO)

Graduates of baccalaureate degree program in ECE must demonstrate knowledge and hands-on competence in the ability to:

PSO – 1	Design, prototype and test modern electronics and telecommunication engineering systems as per the specifications for the professional achievement in an industry and organization
PSO – 2	Apply project management techniques to electrical/ electronic/ telecommunications systems
PSO – 3	Analyze and research appropriate technologies for implementation of the electronics and telecommunication engineering systems

23. (e) Program Structure: B.Tech. in Electronics and Communication Engineering

Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18LEH102J	Chinese	2	0	2	3
18LEH103J	French				
18LEH104J	German				
18LEH105J	Japanese				
18LEH106J	Korean				
18PDH101T	General Aptitude	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDH103T	Social Engineering	2	0	0	2
18PDH201T	Employability Skills & Practices	0	0	2	1
	Total Learning Credits				**12**

Engineering Science Courses (S)

Course Code	Course Title	Hours/ Week L	T	P	C
18MES101L	Engineering Graphics and Design	1	0	4	3
18EES101J	Basic Electrical and Electronics Engineering	3	1	2	5
18MES103L	Civil and Mechanical Engineering Workshop	1	0	4	3
18CSS101J	Programming for Problem Solving	3	0	4	5
18ECS201T	Control Systems	3	0	0	3
	Total Learning Credits				**19**

Open Elective Courses (O)
(Any 4 Courses)

Code	Course Title	L	T	P	C
18ECO101T	Short-Range Wireless Communication	3	0	0	3
18ECO102J	Electronic Circuits & Systems	2	0	2	3
18ECO103T	Modern Wireless Communication Systems	3	0	0	3
18ECO104J	Audio and Speech Signal Processing	2	0	2	3
18ECO105T	Underwater Acoustics	3	0	0	3
18ECO106J	PCB Design and Manufacturing	2	0	2	3
18ECO107T	Fiber Optics and Optoelectronics	3	0	0	3
18ECO108J	Embedded System Design using Arduino	2	0	2	3
18ECO109J	Embedded System Design Using Raspberry Pi	2	0	2	3
18ECO110J	3D Printing Hardware and Software	2	0	2	3
18ECO121T	Basics of Biomedical Engineering	3	0	0	3
18ECO122T	Hospital Information Systems	3	0	0	3
18ECO123T	Biomedical Imaging	3	0	0	3
18ECO124T	Human Assist Devices	3	0	0	3
18ECO125T	Quality Control for Biomedical Devices	3	0	0	3
18ECO126T	Sports Biomechanics	3	0	0	3
18ECO131J	Virtual Instrumentation	2	0	2	3
18ECO132T	Analytical Instrumentation	3	0	0	3
18ECO133T	Sensors and Transducers	3	0	0	3
18ECO134T	Industrial Automation	3	0	0	3
18ECO135T	Fundamentals of MEMS	3	0	0	3
	Total Learning Credits				**12**

Mandatory Courses (M)

Code	Course Title	L	T	P	C
18PDM101L	Professional Skills and Practices	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM101T	Constitution of India	1	0	0	0
18LEM102J	Value Education	1	0	1	0

Basic Science Courses (B)

Course Code	Course Title	Hours/ Week L	T	P	C
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18CYB101J	Chemistry	3	1	2	5
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MAB203T	Probability and Stochastic Processes	3	1	0	4
18MAB302T	Discrete Mathematics for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
	Total Learning Credits				**32**

Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
18ECC102J	Electronic Devices	3	0	2	4
18ECC103J	Digital Electronic Principles	3	0	2	4
18ECC104T	Signals and Systems	3	1	0	4
18ECC105T	Electromagnetics and Transmission Lines	3	0	0	3
18ECC201J	Analog Electronic Circuits	3	0	2	4
18ECC202J	Linear Integrated Circuits	3	0	2	4
18ECC203J	Microprocessor, Microcontroller and Interfacing Techniques	3	0	2	4
18ECC204J	Digital Signal Processing	3	0	2	4
18ECC205J	Analog and Digital Communication	3	0	2	4
18ECC206J	VLSI Design	3	0	2	4
18ECC301T	Wireless Communications	3	1	0	4
18ECC302J	Microwave and Optical Communications	3	0	2	4
18ECC303J	Computer Communication Networks	3	0	2	4
18ECC350T	Comprehension	0	1	0	1
	Total Learning Credits				**52**

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

Course Code	Course Title	Hours/ Week L	T	P	C
18ECP101L	Massive Open Online Course - I	0	0	2	1
18ECP102L	Industrial Training-I				
18ECP103L	Seminar - I				
18ECP104L	Massive Open Online Course - II	0	0	2	1
18ECP105L	Industrial Training-II				
18ECP106L	Seminar - II				
18ECP107L	Minor Project	0	0	6	3
18ECP108L	Internship (4-6 weeks)				
18ECP109L	Project	0	0	20	10
18ECP110L	Semester Internship				
	Total Learning Credits				**15**

Mandatory Courses (M)

Code	Course Title	L	T	P	C
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18LEM110L	Indian Art Form	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0

Professional Elective Courses (E) (Any 6 Courses)					
Course Code	Course Title	Hours/ Week L	T	P	C
	Sub-stream: Electronic Systems Eng.,				
18ECE201J	*Python and Scientific Python*	*2*	*0*	*2*	*3*
18ECE202T	*Micro- and Nano-Fabrication Technologies*	*3*	*0*	*0*	*3*
18ECE203T	*Semiconductor Device Modeling*	*3*	*0*	*0*	*3*
18ECE204J	*ARM based Embedded System Design*	*2*	*0*	*2*	*3*
18ECE205J	*FPGA based Embedded System Design*	*2*	*0*	*2*	*3*
18ECE206J	*Advanced Digital System Design*	*2*	*0*	*2*	*3*
18ECE207J	*Real Time Operating Systems*	*2*	*0*	*2*	*3*
18ECE301J	*CMOS Analog IC Design*	*2*	*0*	*2*	*3*
18ECE302T	*MEMS Technologies*	*3*	*0*	*0*	*3*
18ECE303T	*Nanoelectronic Devices and Circuits*	*3*	*0*	*0*	*3*
18ECE304T	*Microwave Integrated Circuits*	*3*	*0*	*0*	*3*
18ECE305J	*ARM-SoC*	*2*	*0*	*2*	*3*
18ECE306J	*ARM based Digital Signal Processing*	*2*	*0*	*2*	*3*
18ECE307J	*Applied Machine Learning*	*3*	*0*	*0*	*3*

Professional Elective Courses (E) (Any 6 Elective Courses)					
	Sub-stream: Communication Systems Eng.,				
18ECE220T	*Advanced Mobile Communication Systems*	*3*	*0*	*0*	*3*
18ECE221T	*Radar and Navigational Aids*	*3*	*0*	*0*	*3*
18ECE222T	*Adhoc and Sensor Networks*	*3*	*0*	*0*	*3*
18ECE223T	*Satellite Communication and Broadcasting*	*3*	*0*	*0*	*3*
18ECE224T	*Cryptography and Network Security*	*3*	*0*	*0*	*3*
18ECE225T	*Information Theory and Coding*	*3*	*0*	*0*	*3*
18ECE226T	*Optical Components, Systems and Networks*	*3*	*0*	*0*	*3*
18ECE320T	*Software Defined Networks*	*3*	*0*	*0*	*3*
18ECE321T	*RF and Microwave Semiconductor Devices*	*3*	*0*	*0*	*3*
18ECE322T	*Opto Electronics*	*3*	*0*	*0*	*3*
18ECE323T	*Advanced Optical Communication*	*3*	*0*	*0*	*3*
	Sub-stream: Signal Processing				
18ECE240T	*Wavelets and Signal Processing*	*3*	*0*	*0*	*3*
18ECE241J	*Signal Processing for Auditory System*	*2*	*0*	*2*	*3*
18ECE242J	*Pattern Recognition and Neural Networks*	*2*	*0*	*2*	*3*
18ECE243J	*Digital Image and Video Processing*	*2*	*0*	*2*	*3*
18ECE244J	*DSP System Design*	*2*	*0*	*2*	*3*
18ECE245T	*Adaptive Signal Processing*	*3*	*0*	*0*	*3*
18ECE340T	*Machine Perception with Cognition*	*3*	*0*	*0*	*3*
18ECE341T	*Multimedia Compression Techniques*	*3*	*0*	*0*	*3*
18ECE342T	*Acoustical Signal Processing*	*3*	*0*	*0*	*3*
18ECE343T	*Automatic Speech Recognition*	*3*	*0*	*0*	*3*
	Total Learning Credits				**18**

23. (f) Program Articulation: B.Tech. in Electronics and Communication Engineering

Course Code	Course Name	Program Learning Outcomes (PLO)													
		Graduate Attributes											PSO		
		Engineering Knowledge	*Problem Analysis*	*Design & Development*	*Analysis, Design, Research*	*Modern Tool Usage*	*Society & Culture*	*Environment & Sustainability*	*Ethics*	*Individual & Team Work*	*Communication*	*Project Mgt. & Finance*	*Life Long Learning*	*System Design & Analysis*	*Project Management*	*Natural Sciences and Mathematics*
18ECS201T	Control Systems	*H*	*H*	-	-	-	-	-	-	-	-	-	-	*H*	-	-
18ECC102J	Electronic Devices	*H*		-	-	*H*	-	-	*L*	*H*	*M*	-	*M*	*L*	*L*	-
18ECC103J	Digital Electronic Principles	*H*	*M*	*H*	-	*H*	-	-	-	*H*	-	-	-	*M*	-	*L*
18ECC104T	Signals and Systems	*H*	*H*	*M*	*M*	*M*	-	-	-	-	-	-	-	*L*	-	*L*
18ECC105T	Electromagnetics and Transmission Lines	*M*	*H*	-	-		-	-	-	-	-	-	*L*		-	*M*
18ECC201J	Analog Electronic Circuits	*L*	*M*	*H*	-	*M*	-	-	-	*M*	-	-	*M*	*H*	*L*	
18ECC202J	Linear Integrated Circuits	*H*	*M*	*H*	-	*M*	-	-	-	*M*	-	-	-	*H*	*L*	*H*
18ECC203J	Microprocessor, Microcontroller and Interfacing Techniques	*M*	*M*	*M*	-	*H*	-	-	-	-	*H*	-	*H*	*L*	-	*M*
18ECC204J	Digital Signal Processing	*H*	*M*	*H*	-	-	-	-	-	-	-	-	-	*M*	-	*H*
18ECC205J	Analog and Digital Communication	*M*	*H*	*H*	*M*	*H*	-	-	-	*H*	*H*	-	*M*	*H*	*M*	*H*
18ECC206J	VLSI Design	*H*	*M*	*M*	-	*H*	-	-	-	*H*	*M*	*L*	*M*	-	-	*M*
18ECC301T	Wireless Communication	*H*	*H*	*H*	*H*	*M*	-	-	-	-	*M*	-	*M*	*M*	-	*H*
18ECC302J	Microwave & Optical Communications	*H*	*H*	*H*	*M*	-	-	-	-	-	-	-	-	*M*	-	*M*
18ECC303J	Computer Communication Networks	-	-	*M*	-	*L*	*L*	*M*	-	-	-	-	*M*	-	-	*H*
18ECC350T	Comprehension	*H*	*H*	*M*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*M*	*M*	*M*
18ECP101L/ 18ECP104L	Massive Open Online Course-I/II	-	-	-	-	-	*M*	*L*	-	-	*H*	-	*H*	-	*M*	-
18ECP102L/ 18ECP105L	Industrial Training-I/II	*H*	*M*	*M*	*M*	*M*	*L*	*M*	*H*	*H*	*M*	*H*	*M*	*L*	*L*	*L*
18ECP103L/ 18ECP106L	Seminar-I/II	-	*M*	*M*	*H*	-	*M*	*H*	-	-	*H*	-	*M*	-	-	-
18ECP107L/ 18ECP108L	Minor Project / Internship (4-6 weeks)	*H*	*H*	*H*	*H*	*M*	*M*	*H*	*M*	*M*	*M*	*M*	*L*	*M*	*M*	*M*
18ECP109L/ 18ECP110L	Project / Semester Internship	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*

23. (g) Implementation Plan: B.Tech. in Electronics and Communication Engineering

Semester - I

Code	Course Title	Hours/ Week L	T	P	C
18LEH10XJ	Chinese / French / German / Japanese/ Korean	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18CYB101J	Chemistry	3	1	2	5
18CSS101J	Programming for Problem Solving	3	0	4	5
18MES103L	Civil and Mechanical Engineering Workshop	1	0	4	3
18PDM101L	Professional Skills and Practices	0	0	2	0
18LEM102J	Value Education	1	0	1	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
Total Learning Credits					**20**

Semester - II

Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18EES101J	Basic Electrical and Electronics Engineering	3	1	2	5
18PDH101T	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
Total Learning Credits					**21**

Semester - III

Code	Course Title	Hours/ Week L	T	P	C
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18ECS201T	Control Systems	3	0	0	3
18ECC102J	Electronic Devices	3	0	2	4
18ECC103J	Digital Electronic Principles	3	0	2	4
18ECC104T	Signals and Systems	3	1	0	4
18ECC105T	Electromagnetics and Transmission Lines	3	0	0	3
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					**24**

Semester - IV

Code	Course Title	Hours/ Week L	T	P	C
18MAB203T	Probability and Stochastic Processes	3	1	0	4
18BTB101T	Biology	2	0	0	2
18ECC201J	Analog Electronic Circuits	3	0	2	4
18ECC202J	Linear Integrated Circuits	3	0	2	4
	Professional Elective – 1	3	0	0	3
	Open Elective – 1	3	0	0	3
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
Total Learning Credits					**22**

Semester - V

Code	Course Title	Hours/ Week L	T	P	C
18MAB302T	Discrete Mathematics for Engineers	3	1	0	4
18ECC203J	Microprocessor, Microcontroller and Interfacing Techniques	3	0	2	4
18ECC204J	Digital Signal Processing	3	0	2	4
18ECC205J	Analog and Digital Communication	3	0	2	4
	Professional Elective – 2	3	0	0	3
	Open Elective – 2	3	0	0	3
18ECP101L	Massive Open Online Course - I	0	0	2	1
18ECP102L	Industrial Training-I				
18ECP103L	Seminar - I				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM110L	Indian Art Form	0	0	2	0
Total Learning Credits					**23**

Semester - VI

Code	Course Title	Hours/ Week L	T	P	C
18ECC206J	VLSI Design	3	0	2	4
18ECC302J	Microwave and Optical Communication	3	0	2	4
18ECC303J	Computer Communication Networks	3	0	2	4
18ECC350T	Comprehension	0	1	0	1
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Open Elective – 3	3	0	0	3
18ECP104L	Massive Open Online Course - II	0	0	2	1
18ECP105L	Industrial Training-II				
18ECP106L	Seminar - II				
18PDH201T	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
Total Learning Credits					**24**

Semester - VII

Code	Course Title	Hours/ Week L	T	P	C
18ECC301T	Wireless Communications	3	1	0	4
	Professional Elective – 5	3	0	0	3
	Professional Elective – 6	3	0	0	3
	Open Elective – 4	3	0	0	3
18ECP107L	Minor Project	0	0	6	3
18ECP108L	Internship (4-6 weeks)				
Total Learning Credits					**16**

Semester - VIII

Code	Course Title	Hours/ Week L	T	P	C
18ECP109L	Project	0	0	20	10
18ECP110L	Semester Internship				
Total Learning Credits					**10**