

ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum



SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

28 M.Tech in VLSI Design

28. (a) Department Vision Statement

Stmnt - 1	<i>To establish itself as a leading benchmark in the field of electronics and communication engineering by providing high-quality educational and research opportunities that align with advancing technology, while nurturing the development of ethical and skilled professionals.</i>
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28. (b) Department Mission Statement

Stmnt - 1	<i>To consistently uphold the highest standards of educational process aimed at imparting knowledge and skills related to electronic design and communication engineering fostering successful practicing engineers nationally and globally.</i>
Stmnt - 2	<i>To stay at the forefront of technological advancements and adapt our programs to provide cutting-edge learning experiences through collaborative research and innovation in electronics, communication, and interdisciplinary fields through interaction with research institutes and industry to align with the evolving demands of society.</i>
Stmnt - 3	<i>To attract qualified professionals in a rewarding way and enable them to foster the growth of individuals as good leaders, technocrats, and entrepreneurs who are technically skilled and committed to ethical principles in their professional endeavors.</i>

28. (c) Program Education Objectives (PEO)

PEO - 1	<i>To provide the graduates of VLSI design with a strong foundation in analog, digital circuits, system design, semiconductor technology, design automation, hardware design, and scripting languages.</i>
PEO - 2	<i>To enable graduates to practice VLSI design engineering in creating high-performance and low-power systems using acquired knowledge, skills, and tools</i>
PEO - 3	<i>To provide a solid foundation in electronics engineering, preparing graduates for success in higher studies, research, technical careers in industry, academia, entrepreneurship, and consultancy</i>
PEO - 4	<i>To encourage the development of intellectual property through research in specific areas, with an emphasis on indexed journal publication</i>
PEO - 5	<i>To prepare graduates for lifelong learning, enabling them to adapt to professional activities and grasp opportunities throughout their career.</i>

28. (d) Consistency of PEO's with Mission of the Department

	Mission Stmnt. - 1	Mission Stmnt. - 2	Mission Stmnt. - 3
PEO - 1	3	2	1
PEO - 2	3	2	1
PEO - 3	2	3	3
PEO - 4	2	3	1
PEO - 5	2	1	3

28. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.</i>

28. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1	2	2	3
PEO - 2	3	2	3
PEO - 3	3	3	3
PEO - 4	3	3	2
PEO - 5	2	1	3

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

28. (g) Programme Structure: M.Tech VLSI Design

Professional Core Courses (C)							Professional Elective Courses (E) (Any 7 Courses)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21ECC530J	Electronic Design Automation for ASIC and FPGA	2	0	2	3		21ECE531T ³	Signal processing Techniques for VLSI	3	0	0		
21ECC531J	Digital Systems Design Using HDL	3	0	2	4		21ECE532T ³	Hardware Design and Scripting Language	3	0	0	3	
21ECC532T ²	Solid State Devices and Modeling	3	1	0	4		21IPE502T	Vehicle Diagnostics Systems	3	0	0		
21ECC533J ²	Analog Circuits and System Design	3	0	2	4		21ECE533T	Low-Power VLSI Design	3	0	0		
21ECC534J	VLSI Physical Design Automation	3	0	2	4		21NTE510J	Semiconductor Manufacturing Techniques	2	0	2	3	
21IPC501J ²	Research Methodology	2	1	2	4		21IPE504T	Virtual Reality	2	1	0		
21ECC601T ¹	Case Studies	3	0	0	3		21ECE535T ³	Cryptography and Hardware Security in VLSI	3	0	0		
Total Credits					26		21ECE538T	High Performance ASIC Design	3	0	0	3	
							21ECE634T ³	Fundamentals of Solar Cell	3	0	0		
							21ECE534T ³	Reconfigurable Computing Systems	3	0	0		
							21ECE537T ³	Testing of VLSI Circuits	3	0	0	3	
							21ECE539T	Quantum Computation and Algorithms	3	0	0		
							21ECE536T	Integrated Nano-photonics	3	0	0		
							21ECE631T	Mixed Signal IC Design	3	0	0	3	
							21NTE511J	Characterization of Semiconductor Materials and Devices	2	0	2		
							21IPE503T	Embedded Systems for E-Mobility	2	1	0		
							21ECE632T ³	Radio Frequency VLSI	3	0	0		
							21ECE635T	Optimization Techniques in Nanoelectronics	3	0	0	3	
							21ECE636T	Electronics Packaging, Assembly and Testing	3	0	0		
							21ECE600T ¹	Journal Publication	0	0	0		
							21ECE633T ³	Machine Learning in VLSI	3	0	0	3	
							21ECE637T	Quantum Cryptography	3	0	0		
							21ECE638T ³	Reliability Engineering of IC Technology	3	0	0		
Total Credits					21								
							Open Elective Courses (O)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21ECC532T ²	Solid State Devices and Modeling	3	1	0	4		21ECO602T	Digital VLSI Design	3	0	0	3	
21ECC533J ²	Analog Circuits and System Design	3	0	2	4		21ECO603T	Microelectronics Devices	3	0	0	3	
21IPC501J ²	Research Methodology	2	1	2	4		Total Credits					3	
							Course Delivery by online mode (3)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21ECE531T ³	Signal processing Techniques for VLSI	3	0	0	3		21ECE532T ³	Hardware Design and Scripting Language	3	0	0	3	
21ECE532T ³	Hardware Design and Scripting Language	3	0	0	3		21ECE534T ³	Reconfigurable Computing Systems	3	0	0	3	
21ECE534T ³	Reconfigurable Computing Systems	3	0	0	3		21ECE535T ³	Cryptography and Hardware Security in VLSI	3	0	0	3	
21ECE535T ³	Cryptography and Hardware Security in VLSI	3	0	0	3		21ECE537T ³	Testing of VLSI Circuits	3	0	0	3	
21ECE537T ³	Testing of VLSI Circuits	3	0	0	3		21ECE632T ³	Radio Frequency VLSI	3	0	0	3	
21ECE632T ³	Radio Frequency VLSI	3	0	0	3		21ECE633T ³	Machine Learning in VLSI	3	0	0	3	
21ECE633T ³	Machine Learning in VLSI	3	0	0	3		21ECE634T ³	Fundamentals of Solar Cell	3	0	0	3	
21ECE634T ³	Fundamentals of Solar Cell	3	0	0	3		21ECE638T ³	Reliability Engineering of IC Technology	3	0	0	3	
21ECE638T ³	Reliability Engineering of IC Technology	3	0	0	3								

All elective courses may be studied under MOOC platform

¹ 100% assessment by the Department

² Assessment by Open Book Examination

³ Course Delivery through online mode

28. (h) Implementation Plan: M.Tech VLSI Design

Semester - I							
Code	Course Title	Hours/Week					
		L	T	P	C		
21ECC530J	Electronic Design Automation for ASIC and FPGA	2	0	2	3		
21ECC531J	Digital Systems Design Using HDL	3	0	2	4		
21ECC532T ²	Solid State Devices and Modeling	3	1	0	4		
21IPC501J ²	Research Methodology	2	1	2	4		
21ECE531T ³	Signal processing Techniques for VLSI	3	0	0			
21ECE532T ³	Hardware Design and Scripting Language	3	0	0		3	
21IPE502T	Vehicle Diagnostics Systems	3	0	0			
Total Credits						18	
Semester - II							
Code	Course Title	Hours/Week					
		L	T	P	C		
21ECC533J ²	Analog Circuits and System Design	3	0	2	4		
21ECC534J	VLSI Physical Design Automation	3	0	2	4		
21ECE533T	Low-Power VLSI Design	3	0	0			
21NTE510J	Semiconductor Manufacturing Techniques	2	0	2		3	
21IPE504T	Virtual Reality	2	1	0			
21ECE535T ³	Cryptography and Hardware Security in VLSI	3	0	0			
21ECE538T	High Performance ASIC Design	3	0	0		3	
21ECE634T ³	Fundamentals of Solar Cell	3	0	0			
21ECE534T ³	Reconfigurable Computing Systems	3	0	0			
21ECE537T ³	Testing of VLSI Circuits	3	0	0		3	
21ECE539T	Quantum Computation and Algorithms	3	0	0			
Total Credits						17	
Semester - III							
Code	Course Title	Hours/Week					
		L	T	P	C		
	Open Elective	3	0	0	3		
21ECE536T	Integrated Nano-photonics	3	0	0			
21ECE631T	Mixed Signal IC Design	3	0	0			
21NTE511J	Characterization of Semiconductor Materials and Devices	2	0	2		3	
21IPE503T	Embedded Systems for E-Mobility	2	1	0			
21ECE632T ³	Radio Frequency VLSI	3	0	0			
21ECE635T	Optimization Techniques in Nanoelectronics	3	0	0			
21ECE636T	Electronics Packaging, Assembly and Testing	3	0	0		3	
21ECE600T ¹	Journal Publication	0	0	0			
21ECE633T ³	Machine Learning in VLSI	3	0	0			
21ECE637T	Quantum Cryptography	3	0	0		3	
21ECE638T ³	Reliability Engineering of IC Technology	3	0	0			
21ECC601T ¹	Case Studies	3	0	0	3		
Total Credits						15	
Semester - IV							
Code	Course Title	Hours/Week					
		L	T	P	C		
21ECP501L	Specialization Project (OR)	0	0	40	20		
21ECP502L	Specialization Project	0	0	30	15		
21ECP503L	Domain Internship	0	0	10	5		
Total Credits						20	

Students must register either 21ECP501L or 21ECP502L and 21ECP503L both in fourth semester

28. (i) Program Articulation Matrix: M.Tech VLSI Design

Course Code	Course Name	Programme Outcomes		
		1	2	3
21ECC530J	Electronic Design Automation for ASIC and FPGA	3	2	1.5
21ECC531J	Digital Systems Design Using HDL	3	2	3
21ECC532T	Solid State Devices and Modeling	3	2	3
21ECC533J	Analog Circuits and System Design	3	2	1
21ECC534J	VLSI Physical Design Automation	2.8	1	2
21ECC601T	Case Studies	3	2	2
21ECE531T	Signal processing Techniques for VLSI	2.3	2.3	2.3
21ECE532T	Hardware Design and Scripting Language	2.2	2.3	1.8
21ECE533T	Low-Power VLSI Design	2.2	2.5	
21ECE534T	Reconfigurable Computing Systems	3	2	2
21ECE535T	Cryptography and Hardware Security in VLSI	3	2	1.5
21ECE536T	Integrated Nano-photonics	2.8	2	2.5
21ECE537T	Testing of VLSI Circuits	3	2	3
21ECE538T	High Performance ASIC Design	2.2	2.2	2
21ECE539T	Quantum Computation and Algorithms	3	2	3
21ECE631T	Mixed Signal IC Design	2.3	1.8	3
21ECE632T	Radio Frequency VLSI	3	3	2
21ECE633T	Machine Learning in VLSI	3	2	3
21ECE634T	Fundamentals of Solar Cell	3	2	2.5
21ECE635T	Optimization Techniques in Nanoelectronics	3	3	2
21ECE636T	Electronics Packaging, Assembly and Testing	3	2.3	2.3
21ECE637T	Quantum Cryptography	3	2	3
21ECE638T	Reliability Engineering of IC Technology	3	3	2.5
21NTE510J	Semiconductor Manufacturing Techniques	2.8	3	2.4
21NTE511J	Characterization of Semiconductor Materials and Devices	2.8	3	2.4
21ECE600T	Journal Publication			
21IPC501J	Research Methodology	3	2.6	
	Open Elective			
21ECP501L	Specialization Project			
21ECP502L	Specialization Project			
21ECP503L	Domain Internship			
Program Average				

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



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