ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume - 21 Curriculum



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)
Kattankulathur, Chengalpattu District 603203,
Tamil Nadu, India



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India

28 M.Tech in VLSI Design

28. (a)	Department Vision Sta	tement
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	To establish itself as a leading benchmark in the field of electronics and communication engineering by providing high-
Stmt - 1	quality educational and research opportunities that align with advancing technology, while nurturing the development of
	ethical and skilled professionals.

28. (b) Department Mission Statement

Stmt - 1	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.
Stmt - 2	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.
Stmt - 3	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.

28. (c) Program Education Objectives (PEO)

20. (0)	ogram Education Objectives (1 EO)
PEO - 1	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.
PEO - 2	To enable graduates to practice VLSI design engineering in creating high-performance and low-power systems using acquired knowledge, skills, and tools
PEO - 3	To provide a solid foundation in electronics engineering, preparing graduates for success in higher studies, research, technical careers in industry, academia, entrepreneurship, and consultancy
PEO - 4	To encourage the development of intellectual property through research in specific areas, with an emphasis on indexed journal publication
PEO - 5	To prepare graduates for lifelong learning, enabling them to adapt to professional activities and grasp opportunities throughout their career.

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

	Mission Stmt 1	Mission Stmt 2	Mission Stmt 3
PEO - 1	3	2	1
PEO - 2	3	2	
PEO - 3	2	3	3
PEO - 4	2	3	1
PEO - 5	2	N 1 7 7 1	3

28. (e) PO - Program Outcomes

PO - 1	An ability to independently carry out research /investigation and development work to solve practical problems.
PO - 2	An ability to write and present a substantial technical report/document.
PO - 3	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.

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

28. (g) Pro	gramme Structure: M.Tech VLSI	nes	sign				B ()					
Professional Core Courses (C)					Professional Elective Courses (E) (Any 7 Courses)							
Course Hours/					Course	H	lour	s/				
Course	Course	١	Nee			Course Course		١	Wee			
Code	Title	L	Т	Р	С	Code	Title	L	T	P	С	
21ECC530J	Electronic Design Automation for ASIC and FPGA	2	0	2	3		Signal processing Techniques for VLSI Hardware Design and Scripting	3	0	0	3	
21ECC531J	Digital Systems Design Using HDL	3	0	2	4	21ECE3321 °	Language		0	0	3	
0450050072	Solid State Devices and	1	,	_	4		Vehicle Diagnostics Systems Low-Power VLSI Design	3	0	0		
21ECC532T ²	Modeling	3	1	0	4	21NTE510J	Semiconductor Manufacturing	2	0	2	3	
21ECC533J ²	Analog Circuits and System Design	3	0	2	4	21IPE504T	Techniques Virtual Reality	2	1	0		
21ECC534J	VLSI Physical Design Automation		0	2	4	21ECE535T ³	Cryptography and Hardware Security in	3	0	0		
	Research Methodology	2	1	2	4		VLSI			_	3	
21ECC601T ¹	Case Studies Total Credits	3	0	0	3 26		High Performance ASIC Design	3	0	0	ľ	
	Total Credits		1		20		Fundamentals of Solar Cell	3	0	0	_	
							Reconfigurable Computing Systems	3	0	0	2	
	- (1)	فير				21ECE537T 3		3	0	0	3	
	Duniont Wards Justin 12 1					21ECE539T	Quantum Computation and Algorithms Integrated Nano-photonics	3	0	0		
ladue	Project Work, Internship In	/!	٥,			21ECE3361 21ECE631T		3	0	0		
inaus	stry / Higher Technical Institution	19 (J)			21ECE6311 21NTE511J	Characterization of Semiconductor		U		3	
Course	Course		ours			ZINILJIIJ	Materials and Devices	2	0	2	0	
		٧	Veel			21IPE503T	Embedded Systems for E-Mobility	2	1	0	1	
Code	Title	L	T	P	С		Radio Frequency VLSI	3	0	0		
21ECP501L	Specialization Project	0	0	40	20		Optimization Techniques in			0		
245005021	(OR)	0	Λ	20	15	21ECE635T	Nanoelectronics	3	0	0	3	
	Specialization Project Domain Internship	0	0	10	15 5	21ECE636T	Electronics Packaging, Assembly and	3	0	0	3	
	Total Credits				20	21ECE600T ¹	Testing	0	0	0	-	
	20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1			-		Journal Publication Machine Learning in VLSI	3	0	0		
Asses	ssment by Open Book Examinati	on	(²)			21ECE633T	Quantum Cryptography	3	0	0	3	
Course	Course	Н	ours	s/		21ECE6371 Quantum Cryptography 3 0 0 0 21ECE638T 3 Reliability Engineering of IC Technology 3 0 0			٦			
		V	Veel			ZILOLOGOI	Total Credit			0	21	
Code 21ECC532T ²	Title L T P C Solid State Devices and Modeling 3 1 0 4						Open Elective Courses (0)					
21FCC53312	Analog Circuits and System	3	0	2	4			Hou	ıre/	Н		
	Design Research Methodology	2	1	2	4	Course	Course	We				
2111 00010	Acselled Methodology		,		7	Code	Title	LT	Р	С		
400	0/ accompant by the Department	4 /1				21ECO602T	Digital VLSI Design		0	3		
100	% assessment by the Departmer					21ECO603T	Microelectronics Devices	3 0	0	3		
Course	Course		ours			And I I I	Total Credits			3		
Code	Title	L	Veel T	P	С		Course Delivery by online mode (3)					
21ECC601T 1	Case Studies	3	0	0	3	Course	Course		urs/ eek			
ZIECEOUUT	Journal Publication	U	0	0	J	Code	Title				С	
All elective cou	rses may be studied under MOOC	pla	tfori	n		21ECE531T	3 Signal processing Techniques for VLSI	3	0	0	3	
	ment by the Department					21ECE532T	3 Hardware Design and Scripting	3	0	0	3	
Assessment I 3 Course Delive	by Open Book Examination ery through online mode						Language		0		3	
				21ECE534T 21ECE535T	3 Cryptography and Hardware Security		0	0	3			
						21ECE537T	III VLSI		0	Ŭ	3	
				21ECE3371			0	0	3			
							³ Machine Learning in VLSI		0		3	
							Fundamentals of Solar Cell		0		3	
						21ECE638T	Reliability Engineering of IC Technology	3	0	0	3	

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

	Semester - I						Semester - II				
Hours/					Ochiotol II			Hours/			
Code	Code Course Title		Week			Code	Course Title	Week		k	
		L	Τ	Р	С				Τ	Р	С
21ECC530J	Electronic Design Automation for	2	0	2	3		21ECC533J ² Analog Circuits and System Design		0	2	4
	ASIC and FPGA						VLSI Physical Design Automation	3	0	2	4
21ECC531J	Digital Systems Design Using HDL	3	0	2	4	21ECE533T	Low-Power VLSI Design	3	0	0	
	Solid State Devices and Modeling	3	1	0	4	21NTE510J	Semiconductor Manufacturing	2	0	2	3
21IPC501J ²	Research Methodology	2	1	2	4		Techniques		Ĭ		J
21ECE531T 3	Signal processing Techniques for	3	0	0		21IPE504T	Virtual Reality	2	1	0	
212020011	VLSI		Ŭ	Ů		21ECE535T 3	Cryptography and Hardware	3	0	0	
21ECE532T 3	Hardware Design and Scripting	3	0	0	3		Security in VLSI				3
	Language				-	21ECE538T	High Performance ASIC Design	3	0	0	J
21IPE502T	Vehicle Diagnostics Systems	3	0	0			Fundamentals of Solar Cell	3	0	0	
	Total Credits				18	2.2020011	Reconfigurable Computing Systems	3	0	0	
						21ECE537T ³	Testing of VLSI Circuits	3	0	0	3
_						21ECE539T	Quantum Computation and	3	0	0	
						27202007	Algorithms	Ů	Ů		
							Total Credits	•			17
			45	77	33	Semester - IV					
								Н	ours	:/	
	Semester - III					Code	Course Title	٧	Veek	(
			ours						T 0	Р	С
Code	Course Title	٧.	Vee			21ECP501L	21ECP501L Specialization Project			40	20
	0 51 (L	T	Р	С	(OR)					
0.45055005	Open Elective	3	0	0	3		Specialization Project	0	0	30	15
	Integrated Nano-photonics	3	0	0		21ECP503L	Domain Internship	0	0	10	5
	Mixed Signal IC Design	3	0	0	_		Total Credits				20
21NTE511J	Characterization of Semiconductor	2	0	2	3	e ji ning					
04/055007	Materials and Devices	0	4	0		Acres de Ma					
21IPE503T	Embedded Systems for E-Mobility	3	0	0	ļ		The state of the s				
21EUE0321 °	Radio Frequency VLSI	3	U	U		1	X- 34-				
21ECE635T	Optimization Techniques in Nanoelectronics	3	0	0		. 410					
21ECE636T	Electronics Packaging, Assembly				3		/ 4 2				
21ECE0301	and Testing	3	0	0		7					
21ECE600T ¹	Journal Publication	0	0	0		177	7 2 V				
	Machine Learning in VLSI	3	0	0		(h)					
21ECE6331	Quantum Cryptography	3	0	0							
	Reliability Engineering of IC				3	3					
ZILOLOSOI	Technology	3	0	0		E' a ry					
21ECC601T ¹ Case Studies 3 0 0 3							· LEADE 🛹				
21200011	Total Credits		U	U	15		THE REAL PROPERTY.				
# Students must register either 21ECES011 or 21ECES021 and 21ECES021 both in fourth competer											

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

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

28. (I) PI	rogram Articulation Matrix: M. I ech VLSI Design						
Course	Course Name	Programme Outcomes					
Code	Course Name	1	2	3			
21ECC530J	Electronic Design Automation for ASIC and FPGA	3	2	1.5			
21ECC531J	Digital Systems Design Using HDL	3	2	3			
	Solid State Devices and Modeling	3	2	3			
21ECC533J	Analog Circuits and System Design	3	2	1			
	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			
	Low-Power VLSI Design	2.2	2.5				
	Reconfigurable Computing Systems	3	2	2			
21ECE535T	Cryptography and Hardware Security in VLSI	3	2	1.5			
	Integrated Nano-photonics	2.8	2	2.5			
21ECE537T	Testing of VLSI Circuits	3	2	3			
	High Performance ASIC Design	2.2	2.2	2			
	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			
	Fundamentals of Solar Cell	3	2	2.5			
21ECE635T	Optimization Techniques in Nanoelectronics	3	3	2			
	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			
	Characterization of Semiconductor Materials and Devices	2.8	3	2.4			
21ECE600T	Journal Publication						
21IPC501J	Research Methodology	3	2.6				
	Open Elective		4				
21ECP501L	Specialization Project	1 1 1 m					
	Specialization Project						
21ECP503L	Domain Internship	1.7					
	Program Average						

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



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