

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
M.Tech. ECE Scheme

Semester. I

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT661	21ECT501	Advanced Digital Communication Systems	Program Core	Theory	3	3	0	0
2	ECT665	21ECT502	Advanced Microwave Engineering	Program Core	Theory	3	3	0	0
3	ECT914	21ECT504	Mathematical Modelling and Simulation for Communication System	Program Core	Theory	2	2	0	0
4			Program Elective-I	Program Elective	Theory	3	3	0	0
5			Program Elective-II	Program Elective	Theory	3	3	0	0
6	ECP667	21ECP503	Communication Lab-I	Program Core	Lab	3	0	0	3
Total Semester Credit						17			

Semester. II

S.No.	New Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT681	21ECT505	Advanced Antenna Engineering	Program Core	Theory	3	3	0	0
2	ECT683	21ECT506	Advanced Mobile and Wireless Networking	Program Core	Theory	3	3	0	0
3			Program Elective-III	Program Elective	Theory	3	3	0	0
4			Program Elective-IV	Program Elective	Theory	3	3	0	0
5			Program Elective-V	Program Elective	Theory	3	3	0	0
6	ECP668	21ECP507	Communication Lab-II	Program Core	Lab	2	0	0	2
7			Program Elective-V	Program Elective	Lab	1	0	0	2
Total Semester Credit						18			

Semester. III

S.No.	New Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD659	21ECD601	Dissertation	Program Core	Dissertation	8	0	0	16
2	ECD666	21ECD622	Minor Project	Program Core	Research Project	4	0	0	8
Total Semester Credit						12			

Semester. IV

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD660	21ECD603	Dissertation	Program Core	Dissertation	12	0	0	24
Total Semester Credit						12			
Total credits of all semesters						59			

Credit Summary

Semester I	Program Core Courses	11	Taught Courses	17
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	Program Electives	6		
Semester II	Program Core Courses	8	Taught Courses	18
	Program Electives	10		
Semester III	Dissertation	8	Dissertation, Research Project	12
	Research Project	4		
Semester IV	Dissertation	12	Dissertation	12
	Total	59	Total	59

Category	Credits
Program Core	19
Program Electives	16
Open Elective	00
Dissertation, Research Project, Seminar	24
Total Credits	59

List of Program Electives (indicative and NOT limited to)- Any course from M.Tech. (Wireless and Optical Communication, VLSI & Embedded) streams is also included.							
S.No.	Old Course Code	New Course Code	Course Title	Credit	L	T	P
1	ECT665	21ECT815	Optical Codes and Applications	3	3	0	0
2	ECT662	21ECT802	Advanced Digital Signal & Image Processing	3	3	0	0
3	ECT664	21ECT813	Estimation and Detection	3	3	0	0
4	ECT666	21ECT567	Optical Networks	3	3	0	0
5	ECT670	21ECT820	Satellite Communication and Radar Engg.	3	3	0	0
6	ECT674	21ECT810	Cryptography	3	3	0	0
7	ECT678	21ECT811	Design of MIC's & MMIC's	3	3	0	0
8	ECT682	21ECT822	Smart and Phased Array Antenna Design	3	3	0	0
9	ECT684	21ECT807	Advanced topics in Communication	3	2	0	2
10	ECT686	21ECT818	Photonic Integrated Devices and Systems	3	3	0	0
11	ECT688	21ECT812	EMI/EMC	3	3	0	0
12	ECT689	21ECT819	Photonic Switching	3	3	0	0
13	ECT690	21ECT834	Wireless Sensor Networks	3	3	0	0
14	ECT692	21ECT808	Computational Electromagnetics	3	3	0	0
15	ECT694	21ECT806	Advanced Photonic Devices and Components	3	3	0	0
16	ECT696	21ECT832	Telecomm. Technology & management	3	3	0	0
17	ECT698	21ECT804	Advanced Networking analysis	3	3	0	0
18	ECT656	21ECT835	Adaptive Signal Processing	3	3	0	0
19	ECT657	21ECT833	VLSI signal processing architectures	3	3	0	0

20	ECT655	21ECT815	Optical Codes and Applications	3	3	0	0
21	ECT663	21ECT803	Advanced Error Control Codes	3	3	0	0
22	ECT693	21ECT809	Computer Communication & Networking	3	3	0	0
23	ECT673	21ECT805	Advanced Optical Communication Systems & Networks	3	3	0	0
24	ECT685	21ECT821	Short Range Wireless Communication Technologies	3	3	0	0
25	ECT687	21ECT814	Multirate Signal Processing	3	3	0	0
26	ECP900	21ECP900	Technical documentation	1	0	0	2
27	ECT671	21ECT823	Special Modules in ECE - 1(over and above the scheme)	1	1	0	0
28	ECT673	21ECT824	Special Modules in ECE - 2(over and above the scheme)	1	1	0	0
29	ECT675	21ECT825	Special Modules in ECE - 3(over and above the scheme)	1	1	0	0
30	ECT677	21ECT826	Special Modules in ECE- 4(over and above the scheme)	1	1	0	0
31	ECT671	21ECT827	Special Modules in WOC - 1(over and above the scheme)	1	1	0	0
32	ECT673	21ECT828	Special Modules in WOC - 2(over and above the scheme)	1	1	0	0
33	ECT675	21ECT829	Special Modules in WOC - 3(over and above the scheme)	1	1	0	0
34	ECT677	21ECT830	Special Modules in WOC- 4(over and above the scheme)	1	1	0	0

Master of Technology in Embedded Systems
 Department of Electronics & Communication Engineering
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Old Course Code	New Course Code	Course Title	Category	Type	Credits Total	L T P
Semester 1 (Taught Courses-6)						
ECT701	21ECT522	Data Structures & Algorithms	Core	Theor y	3	3-0-0
ECT702	21ECT521	Advanced Microcomputer Systems & Interfacing	Core	Theor y	3	3-0-0
ECT912	21ECT524	Reduced order Modeling, Optimization & Machine intelligence	Core	Theor y	2	2-0-0
ECT709	21ECP523	Hardware Systems Lab	Core	Lab	1.5	0-0-3
ECP711	21ECP525	Software Systems lab	Core	Lab	1.5	0-0-3
		(Elective Courses)¹				
		Program Elective (PE-1)	Elective	Theor y	3	
		Program Elective (PE-2)	Elective	Theor y	3	
		Total Semester Credits			11+ 6=1 7	
Semester 2 (Taught courses- 5)						
ECT704	21ECT526	Computer vision	Core	Theor y	3	3-0-0
ECT712	21ECP528	System Design Lab	Core	Lab	3	0-0-6
ECP900	21ECT529	Technical Documentation	Core	Theor y	1	0-0-2
ECD656	21ECD622	[Minor Project (Research Project)] ²				
		(Elective Courses)**				
		Program Electives (PE-3)	Elective	Theor y	3	
		Program Electives (PE-4)	Elective	Theor y	3	
		Program Electives (PE-5)	Elective	Theor y	3	
		MOOC ³	Optional	Blend ed		
		Total Semester Credits			7+9=16	
		List of Elective Courses				
ECT616	21ECT876	Computer Arithmetic & Micro-architecture Design		Theor y	3	3-0-0
ECT618	21ECT884	Graph Algorithms & Combinatorial optimization		Theor y	3	3-0-0
ECT622	21ECT869	System Level Design & Modeling		Theor y	3	3-0-0
ECT624	21ECT871	VLSI Testing & Testability		Theor y	3	3-0-0
ECT626	21ECT845	Formal Verification of Digital Hardware &		Theor	3	3-0-0

¹ The students may opt for any course from MTech (Embedded Systems) or MTech (VLSI)

² The Minor/Research project is placed in 3rd Semester only. However, for students desirous of INTENRSHIP in 3rd Semester, this Minor project (Research Project) would have to be completed in 2nd Semester.

³ MOOC course is OPTIONAL and over and above the scheme credits, i.e. NOT mandatory and not counted towards minimum credits required for degree

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		Embedded Software		y		
ECT628	21ECT854	Memory Design & Testing		Theor y	3	3-0-0
ECT630	21ECT836	Advance Computer Architecture		Theor y	3	3-0-0
ECT631	21ECT842	Digital System Design & FPGAs		Theor y	3	3-0-0
ECT632	21ECT844	Embedded SoC Design		Theor y	3	3-0-0
ECT634	21ECT855	Micro- & Nano-electro-mechanical Systems (MEMS & NEMS)		Theor y	3	3-0-0
ECT638	21ECT841	Design of Asynchronous Sequential Circuits		Theor y	3	3-0-0
ECT642	21ECT846	FPGA's Physical Design		Theor y	3	3-0-0
ECT648	21ECT851	Languages for (i) Hardware Description, (ii) Scripting and (iii) Simulation/verification; (alternately, 1-credit each for these parts)		Theor y	3	3-0-0
ECT652	21ECT863	RF MEMS		Theor y	3	3-0-0
ECT654	21ECT862	RF Integrated Circuits		Theor y	3	3-0-0
ECT656	21ECT873	Adaptive Signal Processing		Theor y	3	3-0-0
ECT657	21ECT870	VLSI Signal Processing Architectures		Theor y	3	3-0-0
ECT662	21ECT837	Advanced Digital Signal & Image Processing		Theor y	3	3-0-0
ECT690	21ECT834	Wireless Sensor Networks		Theor y	3	3-0-0
ECT703	21ECT839	CAD Algorithms for Synthesis of VLSI Systems		Theor y	3	3-0-0
ECT706	21ECT838	Advanced Embedded software design		Theor y	3	3-0-0
ECT733	21ECT859	Pattern Analysis & Machine intelligence		Theory	3	3-0-0
ECT734	21ECT849	Internet of Things (IoT) & IIoT		Theory	3	3-0-0
ECT735	21ECT860	Probabilistic Machine Learning & AI		Theory	3	3-0-0
ECT736	21ECT853	Medical Engineering & Systems		Theory	3	3-0-0
ECT740	21ECT843	Embedded Intelligent Systems		Theory	3	3-0-0
ECT741	21ECT861	Quantum Computing		Theory	3	3-0-0
				Theory	3	3-0-0
CPT602	21ECT858	Parallel & Distributed Systems		Theor y	3	3-0-0
ECT912	21ECT857	Modeling, Optimization & Transforms		Theor y	2	2-0-0
ECT914	21ECT856	Modeling & Simulation for Communication Engineering		Theor y	2	2-0-0
ECT992	21ECT852	Mathematical Methods & Techniques for ECE Technologists-II		Theor y	3	3-0-0

Kuldeep Singh

Bhargava

Chitrakant Sahu

Vineet Sahula

Tarun Varma

Lava

Master of Technology in Embedded Systems
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Fractional credit courses						
ECT761	21ECT865	Special Modules in Embedded Systems Design-I		Theory	1	1-0-0
ECT762	21ECT866	Special Modules in Embedded Systems Design-II		Theory	1	1-0-0
ECT763	21ECT867	Special Modules in Embedded Systems Design-III		Theory	1	1-0-0
ECT764	21ECT868	Special Modules in Embedded Systems Design-IV		Theory	1	1-0-0
ECT648A	21ECT848	Hardware Description Language		Theory	1	1-0-0
ECT648B	21ECT864	Scripting Language		Theory	1	1-0-0
ECT648C	21ECT850	Language to support Simulation/verification		Theory	1	1-0-0
Semester 3						
		Minor Project (Research Project)%	Core	Research project	4	0-0-8
ECD659	21ECD621	Dissertation	Core	Dissertation	6	0 0 12
Total Semester Credits					4+6=10	
Semester 4						
ECD660	21ECD603	Dissertation	Core	Dissertation	12	(0 0 24)
Total Semester Credits					12	
Total minimum Credits of all semesters (a student might cover more credits > 55)					55	

Sem I	Taught courses + Lab	17
Sem II	Taught courses	16
Sem III	Minor Project (Research Project), Dissertation	4+6=10
Sem IV	Dissertation	12
Total		55

Programme core	18
Programme electives	15
Open elective	00
Minor Project (Research project)	04
Dissertation	18
Total	55

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Scheme of Master of Technology in VLSI Design

Semester. I

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT601	21ECT543	Digital IC Design	Programme Core	Theory	3	3	0	0
2	ECT621	21ECT541	Advanced Semiconductor Devices	Programme Core	Theory	3	3	0	0
3	ECT633	21ECT542	Analog IC Design	Programme Core	Theory	3	3	0	0
4	ECT912	21ECT544	Reduced order Modeling, Optimization & Machine intelligence	Programme Core	Theory	2	2	0	0
5	ECP611	21ECP545	Semiconductor Devices and IC Simulation Lab	Programme Core	Laboratory	1	0	0	2
6		-	Program Elective (PE-1)	Program Elective	Theory	3	3	0	0
7		-	Program Elective (PE-2)	Program Elective	Theory	3	3	0	0
Total Credits						18			

Semester. II

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT634	21ECT546	Micro- & Nano-electro-mechanical Systems (MEMS & NEMS)	Programme Core	Theory	3	3	0	0
2	ECP612	21ECP528	System Design Lab	Programme Core	Laboratory	3	0	0	6
3	ECP900	21ECT529	Technical Documentation	Programme Core	Theory	1	0	0	2
4		-	Program Elective (PE-3)	Program Elective	Theory	3	3	0	0
5		-	Program Elective (PE-4)	Program Elective	Theory	3	3	0	0
6		-	Program Elective (PE-5)	Program Elective	Theory	3	3	0	0
7		-	MOOC Course #			2/3/4			
Total Credits						16			

Semester. III

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD659	21ECD621	Dissertation	Dissertation		6	0	0	12
2	ECD656	21ECD622	Minor Project (Research Project)	Research Project		4	0	0	4
Total Credits						10			

Semester. IV

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD660	21ECD603	Dissertation	Dissertation		12	0	0	24
Total Credits						12			

List of Programme Electives

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT614	21ECT898	VLSI Technology	Program Elective	Theory	3	3	0	0
2	ECT616	21ECT840	Computer Arithmetic & Micro-architecture Design	Program Elective	Theory	3	3	0	0
3	ECT618	21ECT847	Graph Algorithms & Combinatorial optimization	Program Elective	Theory	3	3	0	0
4	ECT622	21ECT869	System Level Design & Modeling	Program Elective	Theory	3	3	0	0
5	ECT624	21ECT871	VLSI Testing & Testability	Program Elective	Theory	3	3	0	0
6	ECT626	21ECT845	Formal Verification of Digital Hardware & Embedded Software	Program Elective	Theory	3	3	0	0
7	ECT628	21ECT854	Memory design & testing	Program Elective	Theory	3	3	0	0
8	ECT630	21ECT836	Advanced Computer Architecture	Program Elective	Theory	3	3	0	0

9	ECT631	21ECT879	Digital System Design & FPGA	Program Elective	Theory	3	3	0	0
10	ECT632	21ECT881	Embedded SoC & Cyber Physical Systems	Program Elective	Theory	3	3	0	0
11	ECT638	21ECT878	Design of Asynchronous Sequential Circuits	Program Elective	Theory	3	3	0	0
12	ECT640	21ECT880	Electronic manufacturing Technology	Program Elective	Theory	3	3	0	0
13	ECT642	21ECT846	FPGAs Physical Design	Program Elective	Theory	3	3	0	0
14	ECT644	21ECT888	Mixed Signal IC Design	Program Elective	Theory	3	3	0	0
15	ECT648	21ECT885	Languages for Hardware Description, Scripting and Simulation	Program Elective	Theory	3	3	0	0
16	ECT649	21ECT889	Nanotechnology & Emerging Applications	Program Elective	Theory	3	3	0	0
17	ECT652	21ECT891	RF MEMS	Program Elective	Theory	3	3	0	0
18	ECT654	21ECT890	RF Integrated Circuits	Program Elective	Theory	3	3	0	0
19	ECT656	21ECT873	Adaptive Signal Processing	Program Elective	Theory	3	3	0	0
20	ECT657	21ECT870	VLSI signal processing architectures	Program Elective	Theory	3	3	0	0
21	ECT658	21ECT877	Current-Mode Analog Signal processing	Program Elective	Theory	3	3	0	0
22	ECT703	21ECT875	CAD Algorithms for Synthesis of VLSI Systems	Program Elective	Theory	3	3	0	0
23	ECT736	21ECT886	Medical Engineering & Systems	Program Elective	Theory	3	3	0	0
24	ECT643	21ECT892	Selected Topics in VLSI-1	Program Elective	Theory	1	1	0	0
25	ECT645	21ECT893	Selected Topics in VLSI-2	Program Elective	Theory	1	1	0	0
26	ECT646	21ECT894	Selected Topics in VLSI-3	Program Elective	Theory	1	1	0	0
27	ECT647	21ECT895	Selected Topics in VLSI-4	Program Elective	Theory	1	1	0	0

MOOC course is over and above the scheme (optional but not mandatory for completion of degree)

Sem I	Taught courses + Lab	17+1=18
Sem II	Taught courses + Lab	16
Sem III	Minor Project (Research Project), Dissertation	4+6=10

Sem IV	Dissertation	12
	Total	56

Programme core	15
Laboratory	4
Programme electives	15
Open elective	00
Minor Project (Research project)	04
Dissertation	18
Total	56

Prof. D. Boolchandani

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MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

DEPARTMENT: Electronics and Communication Engineering

M.Tech. Specialization: Wireless and Optical Communications

Semester I

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT661	21ECT561	Advanced Digital Communication Systems	Core	Theory	3	3	0	0
2	ECT675	21ECT565	Wireless Communications	Core	Theory	3	3	0	0
3	ECT679	21ECT562	Advanced Optical Communication Systems	Core	Theory	3	3	0	0
4	ECT910	21ECT564	Modeling, Optimization & Transforms (RM-II)*	Core	Theory	2	2	0	0
5	ECP669	21ECP563	Communication lab-1	Core	Lab	3	0	0	6
6			Program Elective (PE-1)	Program Elective	Theory	3	3	0	0

Semester II

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECT660	21ECT567	Optical Networks	Core	Theory	3	3	0	0
2	ECP670	21ECP566	Communication lab-2	Core	Lab	2	0	0	2
3	ECP900	21ECT529	Technical Documentation	Program Elective	Lab	1	0	0	2
4			Program Elective (PE-2)	Program Elective	Theory	3	3	0	0
5			Program Elective (PE-3)	Program Elective	Theory	3	3	0	0
6			Program Elective (PE-4)	Program Elective	Theory	3	3	0	0
7			Program Elective (PE-5)	Program Elective	Theory	3	3	0	0

Semester III

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD679	21ECD641	Dissertation	Core	Lab	6	0	0	12
2	ECD667	21ECD662	Research Project	Core	Lab	4	0	0	8

Semester IV

S.No.	Old Course Code	New Course Code	Course Title	Course Category	Type	Credit	L	T	P
1	ECD680	21ECD623	Dissertation	Core	Lab	12	0	0	24

*ECT910: Modeling, Optimization & Transforms (RM-II) is Research Methodology Part B for PhD scholars

Course Structure

Semester	Courses	Total Credits
I	Taught Courses	17
II	Taught Courses	18
III	Dissertation, Research Project	10
IV	Dissertation	12

Total Credits = 57

Credit Distribution

Program Core (Excluding dissertation)	19
Program Elective	16

Open Elective	0
Research Project, Dissertation	22

List of Program Electives (indicative and NOT limited to)- Any course from M.Tech. (Electronics and communication Engineering) and selected courses from other M.Tech streams may also be permitted

S. No.	Old Course Code	New Course Code	Course Title	Credit	L	T	P
1	ECT665	21ECT815	Optical Codes and Applications	3	3	0	0
2	ECT656	21ECT835	Adaptive Signal Processing	3	3	0	0
3	ECT662	21ECT802	Advanced Digital Signal & Image Processing	3	3	0	0
4	ECT664	21ECT813	Estimation and Detection	3	3	0	0
5	ECT670	21ECT820	Satellite Communication and Radar Engg.	3	3	0	0
6	ECT672	21ECT672	Wireless and Mobile Adhoc Networking	3	3	0	0
7	ECT674	21ECT810	Cryptography	3	3	0	0
8	ECT663		Advanced Error Control Codes	3	3	0	0
9	ECT678	21ECT811	Design of Microstrip Antennas	3	3	0	0
10	ECT678	21ECT811	Design of MIC's & MMIC's	3	3	0	0
11	ECT680	21ECT803	Advanced Mobile Systems	3	3	0	0
12	ECT682	21ECT822	Smart and Phased Array Antenna Design	3	3	0	0
13	ECT684	21ECT807	Advanced topics in Communication	3	3	0	0
14	ECT689	21ECT819	Photonic Switching	3	3	0	0
15	ECT692	21ECT808	Computational Electromagnetics	3	3	0	0
16	ECT686	21ECT818	Photonic Integrated Devices and Systems	3	3	0	0
17	ECT690	21ECT834	Wireless Sensor Networks	3	3	0	0
18	ECT694	21ECT806	Advanced Photonic Devices and Components	3	3	0	0
19	ECT698	21ECT804	Advanced Networking analysis	3	3	0	0
20	ECT696	21ECT832	Telecomm. Technology & management	3	3	0	0
21	ECT657	21ECT833	VLSI signal processing architectures	3	3	0	0
22	ECT687	21ECT814	Multirate Signal Processing	3	3	0	0
23	ECT671	21ECT827	Special Modules in WOC - 1(over and above the scheme)	1	1	0	0

24	ECT673	21ECT828	Special Modules in WOC - 2(over and above the scheme)	1	1	0	0
25	ECT675	21ECT829	Special Modules in WOC - 3(over and above the scheme)	1	1	0	0
26	ECT677	21ECT830	Special Modules in WOC- 4(over and above the scheme)	1	1	0	0