MASTER OF ENGINEERING

IN

ELECTRONICS & COMMUNICATION ENGINEERING

VLSI (DESIGN)

REGULAR PROGRAMME

(2024 – 2026)

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING & RESEARCH
(Deemed to be University under Distinct Category)

CHANDIGARH

September 2024

STUDY & EVALUATION SCHEME

SESSION 2024-26

M.E. ELECTRONICS & COMMUNICATION ENGINEERING (VLSI DESIGN)

Program Code: NC24S0721R

REGULAR PROGRAMME (Total Hours = 1800)

FIRST SEMESTER

SUBJECT CODE	SUBJECT	SCHEDULE OF TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	End Semester Examination	TOTAL
As per subject chosen	Program Core-I	4	-	4	4	50	50	100
As per subject chosen	Program Core-II	4	-	4	4	50	50	100
As per subject chosen	Program Core-III	4	-	4	4	50	50	100
As per subject chosen	Program Elective – I	3	-	3	3	50	50	100
As per subject chosen	Program Elective – II	3	-	3	3	50	50	100
072161	Lab – I	-	6	6	3	50	-	50
072171	Research Seminar – I	-	2	2	1	50	-	50
OCA#		-	-	4	-	-	-	-
SEMESTER TOTAL:				30	**22**	**350**	**250**	**600**

 # Out of Class Activities: Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Exploring Internet etc.

SECOND SEMESTER

SUBJECT CODE.	SUBJECT	SCHEDULE OF TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	End Semester Examination	TOTAL
As per subject chosen	Program Core-IV	4	-	4	4	50	50	100
As per subject chosen	Program Core-V	4	-	4	4	50	50	100
As per subject chosen	Program Elective – III	3	-	3	3	50	50	100
As per subject chosen	Program Elective – IV	3	-	3	3	50	50	100
072162	Lab - II	-	6	6	3	50	-	50
072172	Research Seminar – II	-	2	2	1	50	-	50
OCA #		-	-	8	-	-	-	-
SEMESTER TOTAL:				**30**	**18**	**300**	**200**	**500**

 # Out of Class Activities: Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Exploring Internet etc.

THIRD SEMESTER

SUBJECT CODE	SUBJECT	SCHEDULE OF TEACHING (per 5-days week)			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	End Semester Examination	TOTAL
052071	Research Methodology	4	-	4	4	50	50	100
As per subject chosen	OEC / SEC / AEC – I	3	-	3	3	50	50	100
As per subject chosen	OEC / SEC / AEC – II	3	-	3	3	50	50	100
072163	Preliminary Thesis ##	-	15	15	10	-	-	-
OCA #		-	-	5	-	-	-	-
SEMESTER TOTAL:				**30**	**20**	**150**	**150**	**300**

 # Out of Class Activities: Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Exploring Internet etc.

For Preliminary Thesis, Satisfactory ('S') OR Unsatisfactory ('X') grade will be awarded.

FOURTH SEMESTER

SUBJECT CODE.	SUBJECT	SCHEDULE OF TEACHING (per 5-days week)			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	University Examination	TOTAL
072164	Thesis	-	30	30	**20**	**100***	**100**	**200****

* Internal assessment is based on the following criterion:

Grade	Condition
A+	Publication from Thesis in SCI indexed journal
A	Publication from Thesis in Scopus indexed journal
B+	Publication from Thesis in UGC journal **OR** Scopus indexed conference proceedings
B	Publication from Thesis in International Conference
C+	Publication from Thesis in National Conference

** Final Grade will be average of the grades of internal assessment and university viva-voce examination

PROGRAM TOTAL CREDITS = 80

NOTES: 1. *Requirement for the award of **ME Electronics and Communication Engineering (VLSI Design) degree** is 80 credits with minimum CGPA of 6.0*

*2. **Post-Graduate Diploma in ME Electronics & Communication Department (VLSI Design)** will be awarded to those who exit after successful completion of Semester I and II.*

3. The students will study a minimum of 2 and a maximum of 5 SWAYAM-NPTEL self-paced online courses during the program subject to at the most 2 courses in a semester. A 4-weeks duration course will be equivalent to 1 credit course. Any course, except those involving practical component, may be offered in online mode.

4. For SWAYAM-NPTEL courses, the sessional and end-semester examination may be conducted by the institute OR the students may be asked to take the SWAYAM-NPTEL exam by paying the requisite fee and submit the certificate to the department for credit transfer. Grades will be awarded on the basis of marks computed out of 100. In case of reappear in such course, some other course may be repeated with the permission of the Head of the department.

COURSE BASKETS

SEMESTER – I

Three Program Core Courses (PCC) from the following list to be studied in the first semester

SUBJECT CODE	SUBJECT	Credits
072101	Semiconductor Devices	4
072102	Analog IC Design	4
072103	Hardware Description Language	4
072104	Digital IC Design	4
072105	System on Chip Design	4

Two Program Elective Courses (PEC) from the following list to be studied in the first semester

SUBJECT CODE	SUBJECT	Credits
072121	AI Applications in VLSI Design	3
072122	VLSI Technology	3
072123	VLSI Testing & Testability	3
072124	Memory Design and Testing	3
072125	Micro & Nanoelectronics Mechanical Systems(MEMS & NEMS)	3
072126	Electronic Manufacturing Technology	3
072127	FPGAs Based System Design	3
072128	Mixed Signal IC Design	3
072129	Digital System Design	3
072130	Microelectronics: Devices to Circuits	3
072131	Mobile and Wireless Communication	3
072132	VLSI Physical Design Automation	3
072133	Internet of Things	3
072134	Computer Architecture and Organization	3
072135	VLSI for Wireless Communication	3
072136	Embedded System Design	3
072137	Information Theory and Coding	3
072138	Antenna Design for Communication and VLSI Systems	3
072139	Next Generation Communication Systems	3
072140	Real Time Digital Signal Processing	3

Semester II

Two Program Core Courses (PCC) from the following list to be studied in the second semester

SUBJECT CODE	SUBJECT	Credits
072101	Semiconductor Devices	4
072102	Analog IC Design	4
072103	Hardware Description Language	4
072104	Digital IC Design	4
072105	System on Chip Design	4

Two Program Elective Courses (PEC) from the following list to be studied in the second semester

SUBJECT CODE	SUBJECT	Credits
072121	AI Applications in VLSI Design	3
072122	VLSI Technology	3
072123	VLSI Testing & Testability	3
072124	Memory Design and Testing	3
072125	Micro & Nanoelectronics Mechanical Systems (MEMS & NEMS)	3
072126	Electronic Manufacturing Technology	3
072127	FPGAs Based System Design	3
072128	Mixed Signal IC Design	3
072129	Digital System Design	3
072130	Microelectronics: Devices to Circuits	3
072131	Mobile and Wireless Communication	3
072132	VLSI Physical Design Automation	3
072133	Internet of Things	3
072134	Computer Architecture and Organization	3
072135	VLSI for Wireless Communication	3
072136	Embedded System Design	3
072137	Information Theory and Coding	3
072138	Antenna Design for Communication and VLSI Systems	3
072139	Next Generation Communication Systems	3
072140	Real Time Digital Signal Processing	3

SEMESTER – III

A total of Two Courses from the following lists of OEC, SEC & AEC to be studied in the third semester.

OPEN ELECTIVE COURSES (OEC)*

SUBJECT CODE	SUBJECT	Credits
072141	System Design For Sustainability	3
072142	Understanding Incubation And Entrepreneurship	3
072143	Fundamentals of Artificial Intelligence	3
072144	Machine Learning And Deep Learning -- Fundamentals And Applications	3
072145	Learning Analytics Tools	3
072146	Data Science	3
072147	Cloud Computing	3
072148	Soft Computing	3
072149	Optimization from Fundamentals	3
072150	Introduction to Industry 4.0 and Industrial Internet of Things	3
072151	Machine Learning for Engineering and Scientific Applications	3

SKILL ENHANCEMENT COURSES (SEC)

SUBJECT CODE	SUBJECT	CREDITS
072165	Entrepreneurship	3
072166	Patent Law for Engineers and Scientists	3
072167	Advanced Contracts, Tendering and Public Procurement	3
072168	Science Communication: Research Productivity and Data Analytics using Open Source Software	3

ABILITY ENHANCEMENT COURSES (AEC)

SUBJECT CODE	SUBJECT	CREDITS
072181	Environmental Science	3
072182	Soft Skills	3

*** Any other relevant courses in addition to the above listed OEC, SEC & AEC courses may be added from time to time.**

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