

Master of Technology in VLSI Design Tools and Technology

Interdisciplinary Program

Overall Credit Structure

Course category ⇒	Program Core (PC)	Program Electives (PE)	Total
Credits ⇒	18	30	48

Program Core (PC)			
Course No.	Course Title	L-T-P	Credits
ELL734	MOS VLSI	3-0-0	3
ELP736	Physical Design Lab	0-0-6	3
JVD801	Major Project - I	0-0-24	12

For Program Electives, the following 3 streams are available. The students opting for a stream are required to do at least 3 courses out of the PEs recommended for that stream.

1. ASIC and SoC Design
2. Micro and Nano Devices
3. Embedded Intelligent Systems

Program Electives (PE)				
Course No.	Course Title	L-T-P	Credits	Recommended for
COL719	Synthesis of Digital Systems	3-0-2	4	ASIC and SoC Design
COL812	System Level Design and Modeling	3-0-0	3	
COP745	Digital System Design Lab	0-0-6	3	
ELL731	Mixed Signal Circuit Design	3-0-0	3	
ELL735	Analog Integrated Circuits	3-0-0	3	
ELL749	Semiconductor Memory Design	3-0-0	3	
ELL730	IC Technology	3-0-0	3	Micro and Nano Devices
ELL732	Micro/Nanoelectronics	3-0-0	3	
ELL738	Micro and Nanophotonics	3-0-0	3	
ELL739	Advanced Semiconductor Devices	3-0-0	3	
ELL740	Compact Modeling of Semiconductor Devices	3-0-0	3	
ELL744	Electronic and Photonic Nanomaterials	3-0-0	3	
COL788	Embedded Computing	3-0-0	3	Embedded Intelligent Systems
COL821	Reconfigurable Computing	3-0-0	3	
ELL720	Digital Signal Processing-I	3-0-0	3	
ELL741	Neuromorphic Engineering	3-0-0	3	
ELL784	Introduction to Machine Learning	3-0-0	3	
ELL797	Neural Systems and Learning Machines	3-0-0	3	

Program Electives (PE) continued				
Course No.	Course Title	L-T-P	Credits	Recommended for
COL702	Advanced Data Structures	3-0-2	4	All streams
COL718	Architecture of High Performance Computers	3-0-2	4	
CRL702	Architectures and Algorithms for DSP Systems	2-0-4	4	
CRL711	CAD of RF and Microwave Devices	3-0-2	4	
CRL712	RF and Microwave Active Circuits	3-0-0	3	
ELL737	Flexible Electronics	3-0-0	3	
ELL742	Introduction to MEMS Design	3-0-0	3	
ELL743	Photovoltaics	3-0-0	3	
ELL745	Quantum Electronics	3-0-0	3	
ELL746	Biomedical Electronics	3-0-0	3	
ELL747	Active and Passive Filter Design	3-0-0	3	
ELL830	Issues in Deep Submicron VLSI Design	3-0-0	3	
ELL830	Issues in Deep Submicron CMOS IC Design	3-0-0	3	
ELL831	CAD for VLSI, MEMs and Nanoassembly	3-0-0	3	
ELL832	Selected Topics in IEC-I	3-0-0	3	
ELL833	CMOS RF IC Design	3-0-0	3	
ELL883	Embedded Intelligence	3-0-0	3	
ELP831	IEC Lab I	0-0-6	3	
ELP832	IEC Lab II	0-0-6	3	
ELV830	Special Module in Low Power IC Design	1-0-0	1	
ELV831	Special Module in VLSI Testing	1-0-0	1	
JVD799	Minor Project	0-0-12	6	
JVD802	Major Project - II (as per sponsor's advice)	0-0-24	12	
JVS801	Independent Study	0-3-0	3	
MAL704	Numerical Optimization	3-0-0	3	
MAL860	Linear Algebra	3-0-0	3	

Semester-wise schedule

(Options based on Sponsor's advice)

Option 1: Two major projects, 12 credits each

Sem	Courses (Number, L-T-P, credits, abbreviated title)				Credits
I	ELP736 (0-0-6) 3 Physical Design Lab	ELL734 (3-0-0) 3 MOS VLSI	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	12
II	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	PE-5 (3-0-0) 3	PE-6 (3-0-0) 3	12
Summer					
III	JVD801 (0-0-24) 12 Major Project - I				12
IV	JVD802 (0-0-24) 12 Major Project – II				12

Option 2: Minor project (6 credits) plus one major project (12 credits)

Sem	Courses (Number, L-T-P, credits, abbreviated title)				Credits
I	ELP736 (0-0-6) 3 Physical Design Lab	ELL734 (3-0-0) 3 MOS VLSI	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	12
II	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	PE-5 (3-0-0) 3	PE-6 (3-0-0) 3	12
Summer					
III	PE-7 (3-0-0) 3	PE-8 (3-0-0) 3	JVD799 (0-0-12) 6 Minor project		12
IV	JVD801 (0-0-24) 12 Major Project – I				12

Option 3: One major project (12 credits)

Sem	Courses (Number, L-T-P, credits, abbreviated title)				Credits
I	ELP736 (0-0-6) 3 Physical Design Lab	ELL734 (3-0-0) 3 MOS VLSI	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	12
II	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	PE-5 (3-0-0) 3	PE-6 (3-0-0) 3	12
Summer					
III	JVD801 (0-0-24) 12 Major Project - I				12
IV	PE-7 (3-0-0) 3	PE-8 (3-0-0) 3	PE-9 (3-0-0) 3	PE-10 (3-0-0) 3	12