

# Master of Technology in VLSI Design Tools and Technology Interdisciplinary Program

## Overall Credit Structure

Course category ⇒	Program Core (PC)		Bridge courses (BC)	Program Elective (PE)	Total
	Common Core	Stream Core			
Credits ⇒	18	6	6	24	54

Total Program Core = 24 credits

Course No.	Course Title	L-T-P	Credits
<b>Common Core</b>			
EEL734	MOS VLSI	3-0-0	3
EEL736	Physical Design Lab	0-0-6	3
JVD801	Major Project - I	0-0-24	12

<b>Stream Core [Stream: ASIC and SOC Design]</b>			
COL719	Synthesis of Digital Systems	3-0-2	4
EEL782	Analog Integrated Circuits	3-0-0	3
<b>Stream Core [Stream: Micro and Nano Devices]</b>			
EEL739	Advanced Semiconductor Devices (3-0-0)	3-0-0	3
EEL784	IC Technology	3-0-0	3
<b>Stream Core [Stream: Embedded Intelligent Systems]</b>			
COL788	Embedded Computing	3-0-0	3
EEL781	Neural Systems and Learning Machines	3-0-0	3

<b>Bridge Courses [Stream: ASIC and SOC Design]</b>			
COL718	Architecture of High Performance Computers	3-0-2	4
EEL784	IC Technology	3-0-0	3
<b>Bridge Courses [Stream: Micro and Nano Devices]</b>			
EEL732	Microelectronics	3-0-0	3
EEL782	Analog Integrated Circuits	3-0-0	3
<b>Bridge Courses [Stream: Embedded Intelligent Systems]</b>			
COL630	Data Structures	3-0-2	4
COL719	Synthesis of Digital Systems	3-0-2	4
MAL860	Linear Algebra	3-0-0	3

<b>Program Electives [Stream: ASIC and SOC Design]</b>			
COL630	Data Structures	3-0-2	4
COL788	Embedded Computing	3-0-0	3
COL812	System Level Design and Modeling	3-0-0	3
COL821	Reconfigurable Computing	3-0-0	3
COP745	Digital System Design Lab	0-0-6	3
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
EEL602	Operating Systems	3-0-0	3
EEL731	Digital Signal Processing-I	3-0-0	3
EEL732	Microelectronics	3-0-0	3
EEL781	Neural Networks	3-0-0	3
EEL783	Filter Design	3-0-0	3
EEL787	Memory Design and Testing	3-0-0	3
EEL831	Digital Signal Processing-II	3-0-0	3
EEL832	Computer Aided VLSI Design	3-0-0	3
EEL833	Selected Topics in IEC-I	3-0-0	3
EEL881	Issues in Deep Submicron CMOS IC Design	3-0-0	3
EEV832	Special Module in Analog and Mixed Signal	1-0-0	1
EEV833	Special Module in Low Power IC Design	1-0-0	1
EEV834	Special Module in VLSI Testing	1-0-0	1
<b>Program Electives [Stream: Micro and Nano Devices]</b>			
EEL736	Biomedical Electronics	3-0-0	3
EEL737	Flexible Electronics	3-0-0	3
EEL738	Micro and Nanophotonics	3-0-0	3
EEL785	Compact Modeling of Semiconductor Devices	3-0-0	3
EEL7xx	Photovoltaics	3-0-0	3
EEL7xx	Neuromorphic Engineering	3-0-0	3
EEL7xx	Introduction to MEMS Design	3-0-0	3
EEL7xx	Quantum Electronics	3-0-0	3
EEL7xx	Electronic and Photonic Nanomaterials	3-0-0	3

<b>Program Electives [Stream: <i>Embedded Intelligent Systems</i>]</b>			
COL821	Reconfigurable Computing	3-0-0	3
EEL731	Digital Signal Processing-I	3-0-0	3
EEL732	Microelectronics	3-0-0	3
EEL737	Flexible Electronics	3-0-0	3
EEL782	Analog Integrated Circuits	3-0-0	3
EEL786	Mixed Signal Circuit Design	3-0-0	3
EEL787	Memory Design and Testing	3-0-0	3
EEL7xx	Embedded Intelligence	3-0-0	3
EEL7xx	Advanced Machine Learning	3-0-0	3
EEL7xx	Neuromorphic Engineering	3-0-0	3
EEL7xx	Introduction to MEMS Design	3-0-0	3
EEL831	Digital Signal Processing-II	3-0-0	3
EEL833	Selected Topics in IEC-I	3-0-0	3
EEL838	CMOS RF IC Design	3-0-0	3
EEL881	Issues in Deep Submicron CMOS IC Design	3-0-0	3
EEP735	IEC Lab I	0-0-6	3
EEP7xx	Physical Design Lab II	0-0-6	3
EEV832	Special Module in Analog and Mixed Signal	1-0-0	1
MAL704	Numerical Optimization	3-0-0	3
<b>Program Electives [for all streams]</b>			
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

## 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	EEL734 (3-0-0) 3 MOS VLSI	SC-1 (3-0-0) 3	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	BC-1 (3-0-0) 3	15
II	EEP736 (0-0-6) 3 Physical Design Lab	SC-2 (3-0-0) 3	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	BC-2 (3-0-0) 3	15
Summer						
III	JVD801 (0-0-24) 12 Major Project - I					12
IV	JVD 802 (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	EEL734 (3-0-0) 3 MOS VLSI	SC-1 (3-0-0) 3	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	BC-1 (3-0-0) 3	15
II	EEP736 (0-0-6) 3 Physical Design Lab	SC-2 (3-0-0) 3	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	BC-2 (3-0-0) 3	15
Summer						
III	PE-5 (3-0-0) 3	PE-6 (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	EEL734 (3-0-0) 3 MOS VLSI	SC-1 (3-0-0) 3	PE-1 (3-0-0) 3	PE-2 (3-0-0) 3	BC-1 (3-0-0) 3	15
II	EEP736 (0-0-6) 3 Physical Design Lab	SC-2 (3-0-0) 3	PE-3 (3-0-0) 3	PE-4 (3-0-0) 3	BC-2 (3-0-0) 3	15
Summer						
III	JVD801 (0-0-24) 12 Major Project - I					12
IV	PE-5 (3-0-0) 3	PE-6 (3-0-0) 3	PE-7 (3-0-0) 3	PE-8 (3-0-0) 3		12