Indian Institute of Technology Palakkad
Curriculum

IIT PALAKKAD

Program   : **Master of Technology**
Stream   : **System-on-Chip Design**
Year   : **2020 Onwards**

Program Description

With ever-increasing complexity of workloads, the demand for increased performance from a computational system cannot be met only through isolated advances in device technology, circuit design, or system-level design decisions. Therefore, it is important that future graduates: (i) understand the performance requirements of complex systems under various operational constraints, (ii) understand different components and design abstractions that contribute towards building complex systems, and (ii) apply this understanding to improve state-of-the-art in System-on-Chip (SoC) design.

This curriculum is designed to meet these objectives and produce graduates with expertise at the intersection of devices, circuits and systems. At the end of this program, a student would be able to appreciate and apply advances made across domains to design better SoCs.

Semester I

No.	Code	Course Title	L	T	P	C	Category
1	EE5011	VLSI design	3	0	2	4	PMT
2	EE5009	Nanoelectronics for Circuits & Systems	3	0	0	3	PMT
3	CS5019	Advanced Computer Architecture	3	0	0	3	PMT
4	CS5119	Advanced Computer Architecture Lab	0	0	3	2	PMP
5	CS5107	Programming Lab	1	0	3	3	PMP
6	GN5001	Communication and Technical Writing Skills[1]	2	0	0	0	IDC
		Semester Total	12	0	8	15	

Notes if any.

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[1]   Institute Core for all M.Tech Programs

Semester II

No.	Code	Course Title	L	T	P	C	Category
1	CS5XXX	SoC Design Lab	1	0	3	3	PMP
2		Professional Elective 1	3	0	0	3	PME
3		ProfessionalElective 2	3	0	0	3	PME
4		ProfessionalElective 3	3	0	0	3	PME
5		ProfessionalElective 4	3	0	0	3	PME
6		Mini Project	0	0	5	3	PME
7	GN5001	Research Methodology and Professional Ethics[2]	2	0	0	0	IDC
		Semester Total	15	0	8	18	

"Mini Project" is intended to give a student an early start into the major project, knowledge transfer from seniors, and hands-on experience in using tool-chains, experimental set-up. Therefore, based on the interest of a student, this could be a directed reading into a topic, a seminar, or an open-ended project. It is called "Mini project" for lack of a better title.

Summer Term

No.	Code	Course Title	L	T	P	C	Category
1							
		Semester Total	0	0	0	0	

Notes if any.

Semester III

No.	Code	Course Title	L	T	P	C	Category
1		ProfessionalElective 5	3	0	0	3	PME
2		Professional Elective 6	3	0	0	3	PME
3	SD5110	M.Tech Thesis/Project Phase 1	0	0	14	9	PMP
		Semester Total	6	0	14	15	

Notes if any.

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[2] Stream Core. Each stream can decide if this course is to be made compulsory

Semester IV

No.	Code	Course Title	L	T	P	C	Category
1	SD5120	M.Tech Thesis/Project Phase 2	0	0	18	12	PMP
		Semester Total	0	0	18	12	

Notes if any.

Category-wise Summary

Code	Category Description	Credits
PMT	Professional Major Theory (Lecture based core courses)	10
PMP	Professional Major Practise (Lab based core courses) (Project/Internship based core courses)	32
PME	Professional Major Elective (Electives courses from program pool)	18
OE	Open Electives (Any post-graduate course)	0
IDC	Interdisciplinary Course	0
	Total	60

Program Electives
Below is a list of likely electives, and the tentative semester (in the curriculum) students would be able to take them. (* - indicates that the course is yet to be approved)

Electives likely to be offered in 2nd Semester (or even semesters)
(4 electives to be taken as per curriculum)

1. AI for Cybersecurity
2. Cryptography
3. VLSI Architectures for Signal Processing and Machine Learning
4. Digital Verification and Testing*
5. Nanoelectronic Devices
6. Analog Integrated Circuits*
7. RF and Microwave Passive Circuits

Electives likely to be offered in 3rd Semester (or odd semesters)
(2 electives to be taken as per curriculum)

1. Digital Image Processing
2. RF and Microwave Active Circuits
3. Principles and Design of Microelectromechanical System*
4. CAD for VLSI*
5. Multirate Signal Processing*