Indian Institute of Technology Palakkad
Curriculum

Program : **Master of Technology**
Stream : **Computing and Mathematics**
Year : **2020 Onwards**

Program Description

M.Tech program in Computing and Mathematics provides a unique mix of computer science and mathematics courses, thus addressing the increasing demand for individuals with expertise in both these areas. This program also brings in an opportunity for peer learning of students with a background in either of these areas. Candidates posessing a valid GATE score in CS/MA and having completed the requirements of either 1) B.Tech/B.E in Computer Science and Engineering / Information Technology or (2) M.Sc in Mathematics are eligible to apply. First semester curriculum is designed with the above diversity in mind. Apart from the common courses, M.Sc. Mathematics students will be trained in certain basic core courses from computer science and B.Tech. Computer Science and Engineering students will be trained in some core mathematics courses. Later semesters will comprise of a wide spectrum of advanced courses in both the domains. Major areas include Algorithms, Graph Theory, Combinatorics, Logic, Computational Methods and Foundations of Data Science & Machine learning. The program culminates with an year long Project/Dissertation in the second year, that prepares students to pursue careers that require innovations involving sophisticated applications of mathematics in computer science.

Semester I (For students with Computer Science and Engineering background)

No.	Code	Course Title	L	T	P	C	Category
1	CS5013	Topics in Discrete Mathematics	3	0	0	3	PMT
2	CS5009	Algorithms	3	1	0	4	PMT
3	MA5007	Probability and Statistics[1]	4	0	0	4	PMT
4	MA5001	Linear Algebra[2]	4	0	0	4	PMT
5	CS5107	Programming Lab[3]	1	0	3	3	PML
6	GN5001	Communication and Technical Writing Skills[4]	2	0	0	0	IDC
		Semester Total	17	1	3	18	

Semester I (For students with Mathematics background)

No.	Code	Course Title	L	T	P	C	Category
1	CS5013	Topics in Discrete Mathematics	3	0	0	3	PMT
2	CS5009	Algorithms	3	1	0	4	PMT
3	MA5007	Probability and Statistics[5]	4	0	0	4	PMT
4	CS5017	Theory of Computation[6]	3	1	0	4	PMT
5	CS5107	Programming Lab[7]	1	0	3	3	PML
6	GN5001	Communication and Technical Writing Skills[8]	2	0	0	0	IDC
		Semester Total	16	2	3	18	

Note : If a student has already credited a course with a similar content as some core course prescribed in this curriculum, during his/her previous degree, then a program elective course may be credited instead of that course, for completing the credit requirements. For this, the permission of the faculty advisor is to be obtained.

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1   Same course as in M.Sc Mathematics
2   Same course as in M.Sc Mathematics
3   Same course as in M.Tech in SoCD
4   Institute Core for all M.Tech Programs
5   Same course as in M.Sc Mathematics
6   The syllabus of this course is the same as that of fifth semester B.Tech CS course CS3050. The examination and evaluation pattern of the two courses may differ.
7   Same course as in M.Tech in SoCD
8   Institute Core for all M.Tech Programs

Semester II

No.	Code	Course Title	L	T	P	C	Category
1	CS5016	Computational Methods and Applications	2	0	3	4	PMT
2	CS5010	Graph Theory and Combinatorics	3	0	0	3	PMT
3	CS5014	Foundations of Data Science and Machine Learning	3	0	0	3	PMT
4		Program Major Elective	3	0	0	3	PME
5		Open Elective	3	0	0	3	OE
		Semester Total	14	0	3	16	

Summer Term

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

Semester III

No.	Code	Course Title	L	T	P	C	Category
1		Program Major Elective	3	0	0	3	PME
2		Open Elective	3	0	0	3	OE
3		Project / Dissertation Phase 1	0	0	12	8	PMP
		Semester Total	6	0	12	14	

Note : The students are free to take Open Electives either from the set of Program Electives or from the set of any research or PG level electives in the institute.

Semester IV

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

Notes : Minimum credit requirements is 58 credits

Category-wise Summary

Code	Category Description	Credits
PMT	Program Major Theory (Lecture based core courses)	25 (Minimum 23)
PML	Program Major Lab (Lab based core courses)	3
PMP	Program Major Project (Project/Internship based core courses)	20
PME	Program Major Elective (Electives courses from program pool)	6
OE	Open Electives (Any post-graduate course)	6
IDC	Interdisciplinary Course	0
	Total	60 (Minimum 58)