

Indian Institute of Technology Palakkad

Curriculum



IIT PALAKKAD

Program : Master of Technology
Stream : Computing and Mathematics
Year : 2024 Onwards

Introduction

The 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. The curriculum is designed keeping in mind this diversity in the background of students joining the program. Apart from the common courses, students with a mathematics background will be trained in certain basic core courses from computer science and students with a computer science background will be trained in some core mathematics courses. The students will also have the opportunity to take elective courses from a wide spectrum of advanced courses in both the domains. The program culminates with an year-long project/dissertation that prepares students to pursue careers that require innovations involving non-trivial applications of mathematics in computer science.

Credit Requirements

Category of the Course	Credits
Program Major Core (PMC)	19
Program Major Elective (PME)	6
Project Based Courses	22
Open Elective (OE)	6
Humanities and Social Sciences Elective (HSE)	0
Communication Skills (ICC ¹)	1
Technical Writing (ICC ¹)	1
Total	55

¹ Institute Common Course

List of PMCs

No.	Course Name	Credits
1	Algorithms	4
2	Topics in Discrete Mathematics	4
3	Programming Lab	3
4	Linear Algebra ²	4
5	Theory of Computation ³	4
6	Computational Methods and Applications	4

To guide the students towards arriving at a feasible ordering of courses, a course plan is proposed below.

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

No.	Course Code	Course Title	L	T	P	C	Category
1	CS5009	Algorithms	3	1	0	4	PMC
2	CSXXXX	Topics in Discrete Mathematics	3	1	0	4	PMC
3	CS5107	Programming Lab	1	0	3	3	PMC
4	MA5001	Linear Algebra	4	0	0	4	PMC
5		Communication Skills	1	0	0	1	ICC
6		Technical Writing	1	0	0	1	ICC
		Semester Total				17	

Semester I (For students with Mathematics background)

No.	Course Code	Course Title	L	T	P	C	Category
1	CS5009	Algorithms	3	1	0	4	PMC
2	CSXXXX	Topics in Discrete Mathematics	3	1	0	4	PMC
3	CS5107	Programming Lab	1	0	3	3	PMC
4	CS3050	Theory of Computation	3	1	0	4	PMC
5		Communication Skills	1	0	0	1	ICC
6		Technical Writing	1	0	0	1	ICC
		Semester Total				17	

² For students with CS background

³ For students with Math background

Semester II

No.	Course Code	Course Title	L	T	P	C	Category
1	CS5016	Computational Methods and Applications	2	0	3	4	PMC
2		Program Major Elective 1				3	PME
3		Program Major Elective 2				3	PME
4		Open Elective 1				3	OE
5		Open Elective 2				3	OE
		Semester Total				16	

Semester III

No.	Course Code	Course Title	L	T	P	C	Category
1	CMXXXX	Project/Dissertation Phase 1				11	Project
		Semester Total				11	

Semester IV

No.	Course Code	Course Title	L	T	P	C	Category
1	CMXXXX	Project/Dissertation Phase 2				11	Project
		Semester Total				11	

Note: If a student has already credited one or more courses having a similar content as some core courses prescribed in this curriculum, securing a grade equivalent to a B (8 on a 10 point scale) or above for the course, during her previous degree, then the student may request for replacement of such courses. The coordinating department will evaluate the request and may recommend additional elective courses in lieu of the core courses completed during his/her previous degree. For a student who has already completed such courses successfully in his/her previous degree from IIT Palakkad itself, the coordinating department will recommend additional elective courses in lieu of the core courses irrespective of the grade obtained. In both cases, such a change in curriculum for a student has to be approved by the Dean, Academics.

List of PMEs⁴

1. Graph Theory and Combinatorics
2. Topics in Graph Theory
3. Probabilistic Method
4. Parameterized Algorithms

⁴ Last updated in June 2024. For the current list, visit <https://cse.iitpkd.ac.in/>.

5. Approximation Algorithms
6. Combinatorial Optimization
7. Probability and Computing
8. Logic
9. Cryptography
10. Parallel Programming
11. Functional Programming
12. Game Theory and Mechanism Design
13. Coding Theory
14. Computational Complexity
15. Proofs Programs and Types
16. Model Checking
17. Computational Algebra and Number Theory
18. Quantum Computing
19. Communication Complexity
20. Foundations of Data Science and Machine Learning
21. Advanced Computational Complexity
22. Probability and Statistics
23. Real Analysis
24. Numerical Methods
25. Group and Rings
26. Probability Theory
27. Multivariable Calculus