Indian Institute of Technology Palakkad
Curriculum

Program : **Master of Technology**
Stream : **Design & Automation**
Year : **2025 Onwards**

IIT PALAKKAD

Introduction:

The M.Tech. specialization in *Design & Automation* within the Department of Mechanical Engineering at IIT Palakkad offers a well-structured curriculum that prepares students to become leaders in advanced mechanical design and automation. With a focus on innovative design solutions and industry readiness, the program combines rigorous theoretical coursework, practical lab sessions, and project work to equip students with the skills needed to solve complex engineering challenges.

In the first semester, students build a foundation in mathematics, solid mechanics, vibrations, finite element methods, and simulation techniques, using advanced computational tools like Ansys/Abaqus. The second semester advances into specialized subjects such as automation, controls, and dynamics, with laboratory courses that offer practical experience in instrumentation and control. This semester also includes electives, allowing students to tailor their learning towards their career goals. The electives are designed in such a way that students can choose to specialize in solid mechanics, dynamics/vibration, product design, and design for manufacturing, etc.

The credit requirement of the program is as follows:

Credit requirements:

Category of the course	Credits
Program Core (PMC)	19
Program Electives (PME)	9
Project Based Courses	24
Open Electives (OE)	6
Humanities and Social Sciences Elective (HSE)	0
Communication Skills	1
Technical Writing	1
Total	**60**

The list of PMC's with their credits is below :

S No.	Course Name	Credits	Catogory
1)	ME5011A: Mathematics for Engineers	2-0-2-3	PMC
2)	ME5014: Advanced Solid Mechanics	3-0-0-3	PMC
3)	ME5501: Finite Element Methods	3-0-0-3	PMC
4)	ME5015: Mechanical Vibrations	3-0-0-3	PMC
5)	ME5020: Automation and Controls	2-1-0-3	PMC
6)	ME5021: Solid Mechanics & Simulation Laboratory	0-0-3-2	PMC
7)	ME5022: Dynamics & Instrumentation Laboratory	0-0-3-2	PMC
8)	ME5xxx: Internship	0-0-0-0	CWC

To guide the students towards arriving at a feasible ordering of courses, a course plan is proposed below. It is not mandatory to follow this plan. Multiple variations of this plan may be possible. However, students need to ensure that the credit requirements as mentioned in the table above are met. While this system allows flexibility for students to take courses in an order different from that mentioned below, the constraint that prerequisites for each course have to be cleared in advance to be able to take it, necessitates a judicious choice to complete the program within the expected time frame.

Semester I

No.	Course code	Course Title	L	T	P	C	Category
1	ME5011A	Mathematics for Engineers	2	0	2	3	PMC
2	ME5014	Advanced Solid Mechanics	3	0	0	3	PMC
3	ME5015	Mechanical Vibrations	3	0	0	3	PMC
4	ME5501	Finite Element Methods	3	0	0	3	PMC
5	ME5021	Solid Mechanics & Simulation Laboratory	0	0	2	2	PMC
6		Open Elective 1	3	0	0	3	OE
7	GNxxxx	Communication skills	1	0	0	1	ICC
		Semester Total				**18**	

Semester II

No.	Course code	Course Title	L	T	P	C	Category
1	ME5020	Automation and Controls	2	1	0	3	PMC
2	ME5022	Dynamics & Instrumentation Laboratory	0	0	3	2	PMC
3	MExxxx	Professional Major Elective 1	3	0	0	3	PME
4	MExxxx	Professional Major Elective 2	3	0	0	3	PME
5	MExxxx	Professional Major Elective 3	3	0	0	3	PME
6		Open Elective 2	3	0	0	3	OE
7	GNxxxx	Technical Writing	1	0	0	1	ICC
		Semester Total				**18**	

Summer Recess/Break:

No.	Course code	Course Title	L	T	P	C	Category
1	MExxxx	Internship (for 6-8 weeks)	0	0	0	0	CWC, Pass/Fail
		Semester Total				**0**	

Semester III

No.	Course code	Course Title	L	T	P	C	Category
1	MExxxx	MTech Project (MTP) Stage 1	0	0	30	12	Project based course
		Semester Total				**12**	

Semester IV

No.	Course code	Course Title	L	T	P	C	Category
1	MExxxx	MTech Project (MTP) Stage 2	0	0	30	12	Project based course
		Semester Total				**12**	

A list of approved PME's can be found below:

S No.	Course Name	Credits
1)	ME5001: Fracture Mechanics	3-0-0-3
2)	ME5615: Impact Mechanics of Solids	3-0-0-3
3)	ME5635: Mechanics of Composite Materials	3-0-0-3
4)	ME5636: Non-Linear Elasticity	3-0-0-3
5)	ME6001: Continuum Mechanics	3-0-0-3

6)	ME6002: Theory of Elasticity	3-0-0-3
7)	ME5617: Wheeled Mobile Robots	3-0-0-3
8)	ME5622: Vehicle Dynamics	2-1-0-3
9)	ME5623: Mechanics and Control of Robotic Manipulators	3-0-0-3
10)	ME5625: Fundamentals of Acoustics	3-0-0-3
11)	ME5637: Rotordynamics	3-0-0-3
12)	ME5638: Advanced Dynamics	3-0-0-3
13)	EE5022: Synthesis of Control	3-0-0-3
14)	EE5515: Control of Non-Linear Dynamical Systems	3-0-0-3
15)	EE5521: Optimal Control	3-0-0-3
16)	EE5531: Reinforcement Learning based Control	3-0-0-3
17)	ME5002: Computer Aided Metrology	3-0-0-3
18)	ME5004: Mechanical Behaviour of Materials	3-0-0-3
19)	ME5005: Modern Manufacturing Processes	3-0-0-3
20)	ME5007: Advanced Engineering Materials	3-0-0-3
21)	ME5009: Digital Manufacturing	3-0-0-3
22)	ME5639: Principles of Product Design	3-0-0-3
23)	ME5614: Computational Fluid Dynamics	3-0-0-3