

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MECHANICAL ENGINEERING DEPARTMENT

Program: M.Tech.

Specialization: Manufacturing Processes, Systems, and Automation

Department: Mechanical Engineering

Semester I

Course No.	Course Title	L	T	P	C	Course Tag*
ME 899	Communication Skills	PP/NP				C
ME 637	Manufacturing Automation	3	0	0	6	C
ME 756	Modelling & Analysis of Manufacturing Processes	3	0	0	6	C
ME 7002	Production Systems & Sustainability	3	0	0	6	C
	Elective I	3	0	0	6	D
	Elective II	3	0	0	6	D
	Elective III / Institute Elective	3	0	0	6	D / I [#]
	TOTAL CREDITS	36				

C = Core; D = Department Elective; I = Institute Elective ***New Course

If the student opts for “I” in 1st semester then he/she has to opt for “D” in 2nd semester and vice versa.

Department Electives: Minimum FIVE courses from elective baskets (EB1, EB2, EB3) with at least ONE elective to be chosen from each basket. Students may opt a maximum of TWO electives from the Other Department Elective Basket (EB4).

Semester II

Course No.	Course Title	L	T	P	C	Course Tag*
ME 643	Materials Processing and Simulation Lab	0	0	3	3	C
ME 694	Seminar	0	0	4	4	C
	Institute Elective / Elective III	3	0	0	6	I / D [#]
	Elective IV	3	0	0	6	D
	Elective V	3	0	0	6	D
	Elective VI	3	0	0	6	D
	Elective VI	3	0	0	6	D
	TOTAL CREDITS	37				

Semester III

Course No.	Course Title	L	T	P	C	Course Tag*
ME 797	MTech Project: Stage I	0	0	3	50	C
	TOTAL CREDITS	50				

Semester IV

Course No.	Course Title	L	T	P	C	Course Tag*
ME 798	MTech Project: Stage II	0	0	3	40	C
	TOTAL CREDITS	40				

Elective Basket 1: Numerical Methods and Data Science

Course No.	Course Title
ME 415	Computational Fluid Dynamics and Heat Transfer
ME 613	Finite Element and Boundary Element Methods
ME 621	Mathematical Methods for Mechanics and Dynamics
ME 673	Mathematical Methods in Engineering
ME 701	Optimization Methods in Engineering Design
ME 778	Moving Boundary Problems in Solidification
ME 781	Engineering Data Mining and Applications
ME 789	Computational Tools for Process Modeling
ME 794	Statistical Design of Experiments

Elective Basket 2: Materials and Manufacturing Processes

Course No.	Course Title
ME 645	MEMS - Design, Fabrication, and Characterization
ME 636	Advanced Joining Technology
ME 677	Laser Material Processing
ME 730	Ultra Precision Machining
ME 750	Sheet Metal Engineering
ME 772	Processing of Aerospace Materials I
ME 774	Processing of Aerospace Materials II
ME 793	Multiscale Materials Informatics, Discovery and Design
ME 800	Additive Manufacturing: Design, Processes and Inspection
ME 802	Manufacturing Technologies for Electric Mobility
ME 6103	Ultrafast Lasers: Fundamentals and Applications
ME 6110	Nanomanufacturing Processes
ME 6116	Design of Fiber Reinforced Composites

Elective Basket 3: Manufacturing Systems and Automation/Robotics/Control

Course No.	Course Title
ME 604	Robotics
ME 748	Computer Aided Simulation of Machines
ME 754	Textile Machines Design and Automation
ME 779	Control Systems
ME 6102	Design of Mechatronic Systems
ME 7001	Mechanism Simulation and Synthesis
ME 617	Rapid Product Development
ME 669	Design for Manufacturing
ME 711	Manufacturing Planning and Control
ME 712	CNC and Programming
ME 735	Computer Graphics and Product Modelling
ME 768	Introduction to Microsystems Packaging
ME 773	Reliability Modelling and Analysis for Engineering Systems
ME 7001	Mechanism Simulation and Synthesis

Elective Basket 4: Students can also choose a maximum of two courses from the other department electives, corresponding to the thematic areas in EB1 to EB3, listed below.

Course No.	Course Title
Materials and Manufacturing Processes	
MM 621	Advanced Physical and Mechanical Metallurgy
MM 654	Advanced Composites
MM 685	Electrical Materials: Fundamentals and Applications
MM 755	Kinetics of High Temperature Processes
Numerical Methods and Data Science	
IE 604	System Dynamics Modelling and Analysis
IE 605	Engineering Statistics
IE 609	Mathematical Optimization Techniques
IE 630	Simulation Modelling and Analysis
SC 646	Distributed Optimization and Machine Learning
Robotics, Automation and Control	
SC 625	Systems Theory
SC 639	Mathematical Structures for Control
SC 664	Active Vibration Control
EE 622	Optimal Control Systems
EE 640	Multivariable Control Systems
Production Systems and Digital Manufacturing	
IE 714	Quantitative Models for Supply Chain Management
IE 802	Topics in Industrial Engineering and Operations Research
SOM 694	Sustainability: Theory to Action