Maulana Azad National Institute of Technology Bhopal – 462003

Department of Materials and Metallurgical Engineering

M.Tech Scheme of Study: Materials and Metallurgical Engineering

(3 Years)

(2026 Admitted Batch Onwards)

Programme Highlights

1. **1st and 2nd Semesters- Strong Foundation:**
   Foundational courses in Materials and Metallurgical Engineering are complemented by ***Data Structures and Algorithms, Introduction to Artificial Intelligence and Machine Learning, and Numerical Computation lab using Python,*** providing students with interdisciplinary and computational skills.

2. **3rd and 4th Semesters: Advanced learning & Employability:**
   Advanced courses such as ***Semiconductor Materials, Devices and Processing. Along with Computer-Aided Engineering (CAE) Lab*** and a range of Departmental and Open electives, are offered to enhance students' employability, technical expertise and preparedness for higher studies.

3. **5th and 6th Semesters: Research and Industries Exposure:**
   Students undertake dissertation Phase-I and Phase-II, either at the Institute or with prior approval, at a collaborating institute/organization, preferably ***IITs, CSIR laboratories, or reputed industries to work on real life problems***. This provision enables students to gain valuable research and industrial exposure and strengthen their prospects for higher studies and professional careers.

Maulana Azad National Institute of Technology Bhopal – 462003

Department of Materials and Metallurgical Engineering

M.Tech Scheme of Study: Materials and Metallurgical Engineering

(3 Years)

(2026 Admitted Batch Onwards)

Semester-I

Course No.	Course Name	Periods per week			Credits
		L	T	P	
MCMT1001	Advanced Mathematics	3	-	-	3
MMME1101	Unit Operations in Non-Ferrous Metals Extraction	3	-	-	3
MMME1102	Thermodynamics of Materials	3	1	-	4
MMME1103	Structure, Properties and Characterization of Materials	3	-	-	3
MMME1104	Manufacturing Processes-I	3	-	-	3
MMME1105	Manufacturing Processes Lab – I	-	-	2	1
MMME1106	Materials Characterization Lab	-	-	2	1
MMME1107	Numerical Computation Lab	-	-	2	1
MMME1108	Seminar-I	-	-	2	1
HS1101	Communication skills (Audit)	0	0	2	0
Total Hours – 26 Total Credits – 20		Semester Credits			20

Semester-II

Course No	Course Name	Periods per week			Credits
		L	T	P	
MMME1201	Data Structure and Algorithm	3	-	-	3
MMME1202	Introduction to Artificial Intelligence and Machine Learning	3	1	-	4
MMME1203	Iron & Steel Making	3	-	-	3
MMME1204	Mechanical Behavior of Materials	3	-	-	3
MMME1205	Transport Phenomena	3	-	-	3
MMME1206	Metallography and Heat Treatment Lab	-	-	2	1
MMME1207	Materials Testing Lab	-	-	2	1
MMME1208	Extractive Metallurgy Lab	-	-	2	1
MMME1209	Seminar-II	-	-	2	1
Total Hours – 24 Total Credits – 40		Semester Credits			20

Semester-III

Course No.	Course Name	Periods per week			Credits
		L	T	P	
MMME2101	Manufacturing Process-II	3	1	-	4
MMME2102	Failure Analysis and Quality Management	3	-	-	3
MMME2103	Semiconductor Materials, Devices and Processing	3	-	-	3
MMME2151-2159	Program Elective 1(A)	3	-	-	3
MMME2161-2169	Program Elective 2(A)	3	-	-	3
MMME2104	Electronics Materials Lab	-	-	2	1
MMME2105	Failure Analysis Lab	-	-	2	1
MMME2106	Manufacturing Process Lab- II	-	-	2	1
MMME2107	Internship/ Industrial Training	-	-	2	1
Total Hours – 24 Total Credits – 60		Semester Credits			20

Semester-IV

Course No	Course Name	Periods per week			Credits
		L	T	P	
MMME2201	Research Methodology	3	-	-	3
MMME2251-2259	Program Elective 3(A) *	3	-	-	3
MMME2261-2269	Program Elective 4(A)	3	-	-	3
	Open Elective -1(A)	3	-	-	3
	Open Elective 2(A)	3	-	-	3
MMME2202	Computer Aided Engineering Lab (CAE)	-	-	2	1
MMME2203	Minor Project	-	-	4	2
Total Hours – 21 Total Credits – 78		Semester Credits			18
One program elective may be a compulsory subject of B.Tech. 6th Semester					

Semester-V

Course No	Course Name	Periods per week			Credits
		L	T	P	
	Open Elective-3(A)/ [NPTEL/SWAYAM Courses only]	3	-	-	3
MMME3101	Dissertation Phase –I	-	-	36	18
Total Hours – 39 Total Credits – 99		Semester Credits			21

Semester-VI

Course No	Course Name	Periods per week			Credits
		L	T	P	
MMME3251-3259	Program Elective-5(A)/ [NPTEL/SWAYAM Courses only]	3	-	-	3
MMME3201	Dissertation Phase –II	-	-	36	18
Total Hours – 39 Total Credits – 120		Semester Credits			21
Dissertation Phase-1 /Phase-2 or both can be done outside the institute and it is applicable only to students who proceed to a collaborating institute for research work after obtaining prior approval from their Research Guide and/or the DPPC.					

Program Elective Groups			
1(A)		2(A)	
MMME2151	Powder Processing of Materials	MMME2161	Advanced Casting and Solidification
MMME2152	Corrosion and Wear Engineering	MMME2162	Research Methodology
MMME2153	Advanced Ceramic Materials	MMME2163	High Temperature Materials
MMME2154	Advanced Manufacturing Technology	MMME2164	Nano Materials
MMME2155	Composite Materials	MMME2165	Advanced Metal Forming Techniques
3(A)		4(A)	
MMME2251	Advanced Magnetic Materials and their Applications	MMME2261	X-Ray Diffraction and Electron Microscopy
MMME2252	Advanced Materials & Manufacturing	MMME2262	Industry 4.0 and Quality Control
MMME2253	Computational Materials Design	MMME2263	Fracture Mechanics and Fatigue
MMME2254	Advanced Joining Technologies	MMME2264	Non-Destructive Testing
5(A)			
MMME3251	Additive Manufacturing with Metals	MMME3255	Recycling and Sustainable Metallurgical Processes
MMME3252	Engineering Polymers and Composites	MMME3256	Thermodynamics and kinetic modelling
MMME3253	Selection and Design of Materials	MMME3257	Surface coating Technology
MMME3254	Multi-Functional Materials	MMME3258	Energy Materials

For PhD Students

Course Number	Course Name	Credit
MME PSE 1	Seminar I	2
MME PSE 2	Seminar II	2