



I Semester

Section A,B,C,D & E						Section F, G, H, I & J					
Code	Course Name	Periods per week			Credits	Code	Course Name	Periods per week			Credits
		L	T	P				L	T	P	
MC1101	Mathematics 1	3	1	-	4	MC1101	Mathematics 1	3	1	-	4
PY1102	Physics	3	-	-	3	CY1107	Engineering Chemistry	3	-	-	3
CE1103	Engineering Mechanics	2	1	-	3	EE1108	Basic Electrical & Electronics Engineering	2	1	-	3
ME1104	Engineering Graphics	1	-	-	1	ME1109	Manufacturing Science	1	-	-	1
CS1105	Computer Programming & Problem Solving	2	-	-	2	CY1110	Environmental Science	2	-	-	2
HS1106	Communication Skill	1	-	-	1	BS1111	Biology for Engineers	2	-	-	2
CE1121	Engineering Mechanics Laboratory	-	-	2	1	HS1112	Indian knowledge Systems and Cognitive Well being	-	2	-	2
PY1122	Physics Laboratory	-	-	2	1	EE1125	Basic Electrical & Electronics Engineering Laboratory	-	-	2	1
ME1123	Engineering Graphics Laboratory	-	-	2	1	CY1126	Engineering Chemistry Laboratory	-	-	2	1
CS1124	Computer Programming Laboratory	-	-	2	1	ME1127	Manufacturing Science Laboratory	-	-	2	1
HS1128	Language Laboratory	-	-	2	1	SA1143 or SA1144 or SA1145	NSS or Yoga or Universal Human Values and Professional Ethics	-	-	2	1
SA1141 or SA1142	Life Skill Management or Physical Education	-	-	2	1			13	4	8	21
		12	2	12	20	NC115*	National Cadet Corps I	1	1	-	2
NC115*	National Cadet Corps I	1	1	-	2						

***Not to be counted in SGPA/ CGPA calculations**



II Semester

Section A,B,C,D & E						Section F, G, H, I & J					
Code	Course Name	Periods per week			Credits	Code	Course Name	Periods per week			Credits
		L	T	P				L	T	P	
MC1201	Mathematics II	3	1	-	4	MC1201	Mathematics II	3	1	-	4
CY1207	Engineering Chemistry	3	-	-	3	PY1202	Physics	3	-	-	3
EE1208	Basic Electrical & Electronics Engineering	2	1	-	3	CE1203	Engineering Mechanics	2	1	-	3
ME1209	Manufacturing Science	1	-	-	1	ME1204	Engineering Graphics	1	-	-	1
CY1210	Environmental Science	2	-	-	2	CS1205	Computer Programming & Problem Solving	2	-	-	2
BS1211	Biology for Engineers	2	-	-	2	HS1206	Communication Skill	1	-	-	1
HS1212	Indian knowledge Systems and Cognitive Well being	-	2	-	2	CE1221	Engineering Mechanics Laboratory	-	-	2	1
EE1225	Basic Electrical & Electronics Engineering Laboratory	-	-	2	1	PY1222	Physics Laboratory	-	-	2	1
CY1226	Engineering Chemistry Laboratory	-	-	2	1	ME1223	Engineering Graphics Laboratory	-	-	2	1
ME1227	Manufacturing Science Laboratory	-	-	2	1	CS1224	Computer Programming Laboratory	-	-	2	1
SA1243 or SA1244 or SA1245	NSS or Yoga or Universal Human Values and Professional Ethics	-	-	2	1	HS1228	Language Laboratory	-	-	2	1
		13	4	8	21	SA1241 or SA1242	Life Skill Management or Physical Education	-	-	2	1
NC125*	National Cadet Corps I	1	1	-	2			12	2	12	20
						NC125*	National Cadet Corps I	1	1	-	2

***Not to be counted in SGPA/ CGPA calculations**

First Year

Total Credits	Lecture	Tutorial	Practical	Hours
41	25	6	20	41



B. Tech. III Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
HS2001	Fundamental of Entrepreneurship	3	-	-	3
MM2101	Unit Operations in Non-Ferrous Metals Extraction	3	-	-	3
MM2102	Thermodynamics of Materials	3	-	1	4
MM2103	Structure, Properties and Characterization of Materials	3	-	-	3
MM2104	Manufacturing Processes-I	3	-	-	3
MM2109	Numerical Computation using Python	2	1	-	3
MM2105	Manufacturing Processes Lab - I	-	-	2	1
MM2106	Materials Characterization Lab	-	-	2	1
MM2107	Numerical Computation Lab	-	-	2	1
MM2108	Professional Practice	-	2	-	2
Total Hours = 27		18	3	6	24
Total Credits (Cumulative)					65
Additional Subject: National Cadet Corps (NCC)					
NC 2151	National Cadet Corps III	1	5	1	7
Total Credits (Cumulative)					11

B. Tech. IV Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
CS2001	Data Structure and Algorithm	2	1	-	3
MM2201	Introduction to Artificial Intelligence and Machine Learning	3	1	-	4
MM2202	Iron & Steel Making	3	-	-	3
MM2203	Mechanical Behavior of Materials	3	-	-	3
MM2204	Transport Phenomena	3	-	-	3
MM2205	Phase Transformation and Heat Treatment	3	-	-	3
MM2206	Metallography and Heat Treatment Lab	-	-	2	1
MM2207	Materials Testing Lab	-	-	2	1
MM2208	Project Based Lab-1	-	-	2	1
Total Hours = 25		17	2	6	22
Total Credits (Cumulative)					87
Additional Subject: National Cadet Corps (NCC)					
NC2251	National Cadet Corps IV	2	-	1	3
Total Credits (Cumulative)					14



B. Tech. V Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MM3101	Manufacturing Process-II	3	1	-	4
MM3102	Critical Metals Extraction and Recycling	3	-	-	3
MM3103	Semiconductor Materials, Devices and Processing	3	-	-	3
MM3104	Electrometallurgy and Batteries	3	-	-	3
MM3109	Industrial Management	3	-	-	3
MM(3151 – 3157)	Programme Elective -1(A)	3	-	-	3
MM3105	Electronics Materials Lab	-	-	2	1
MM3106	Metal Extraction Lab	-	-	2	1
MM3107	Manufacturing Processes Lab - II	-	-	2	1
MM3108	Internship/ Industrial Training	-	-	2	1
Total Hours = 27		18	1	8	23
Total Credits (Cumulative)					110
Additional Subject: National Cadet Corps (NCC)					
NC3151	National Cadet Corps V	1	5	1	7
Total Credits (Cumulative)					21

B. Tech. VI Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MG2201	Supply Chain Management	3	1	-	4
MM3201	Computational Materials Design	3	1	-	4
MM3202	Corrosion and Wear Engineering	3	-	-	3
MM3203	Advanced Materials and Manufacturing	3	-	-	3
MM(3251 – 3257)	Department Elective-2 (A)	3	-	-	3
MM3204	Computational Materials Design Lab	-	-	2	1
MM3205	Corrosion and Wear Lab	-	-	2	1
MM3206	Computer Aided Engineering Lab (CAE)	-	-	2	1
MM3207	Project Based Lab-2	-	-	2	1
Total Hours = 25		15	2	8	21
Total Credits (Cumulative)					131
Additional Subject: National Cadet Corps (NCC)					
NC3251	National Cadet Corps VI	2	-	1	3
Total Credits (Cumulative)					24



B. Tech. VII Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
HS4101	Engineering Economics & IPR	3	-	-	3
MM4101	Failure Analysis and Quality Management	3	-	-	3
MM(4151 – 4157)	Department Elective-3 (A)	3	-	-	3
MM(4161 – 4167)	Department Elective-4 (A)	3	-	-	3
	Open Elective-1(C)	3	-	-	3
MM4102	Failure Analysis Lab	-	-	2	1
MM4103	Project-1#	-	-	4	2
MM4104	Internship/Field Training	-	-	2	1
Total Hours = 23		15	-	8	19
Total Credits (Cumulative)					150

B. Tech. VIII Semester

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MM (4251 – 4256)	Department Elective-5(A)/ [NPTEL/SWAYAM Courses only]	3	-	-	3
MM (4261 – 4266)	Department Elective-6(A)/ [NPTEL/SWAYAM Courses only]	3	-	-	3
MM4201/MM4202	Project-2 / Internship#	-	-	16	8
MM4203	General Proficiency	-	-	-	1
Total Hours = 22		6	-	16	15
Cumulative Credits					165

It May be earned by startup activity.



MM(3151 – 3157)	Departmental Elective-1 (A)
MM 3151	Selection and Design of Materials
MM 3152	Advanced Steel Making
MM 3153	Artificial Intelligence for Materials Design
MM 3154	High Temperature Materials
MM 3155	Nanomaterials
MM 3156	Fuel Furnace and Refractories
MM 3157	Non-Destructive Testing

MM(3251 – 3257)	Department Elective-2 (A)
MM 3251	Optical and Magnetic Materials
MM 3252	Computational Welding Mechanics
MM 3253	Dislocation Theory
MM 3254	Composite Materials
MM 3255	Modelling and Simulation of Metallurgical Process
MM3256	Advanced Characterization Techniques
MM3257	Hydrogen Energy: Production, Storage and Applications

MM (4151 – 4157)	Department Elective-3 (A)
MM 4151	Spectroscopic Techniques for Materials
MM 4152	Functional Materials
MM 4153	Integrated Computational Material Science
MM 4154	Waste Management
MM 4155	Lightweight Materials
MM 4156	Additive Manufacturing
MM 4157	Nuclear Materials

MM(4161 – 4167)	Department Elective-4 (A)
MM 4161	Fracture Mechanics
MM 4162	Polymer Science and Engineering
MM 4163	Physical Metallurgy of Alloy Steels
MM 4164	Computational Thermodynamics of Alloys
MM 4165	Molecular Dynamics for Materials Engineer
MM 4166	Nuclear Reactor Engineering
MM 4167	Thermal Barrier Coating and Surface Engineering



मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल-462003

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY BHOPAL – 462003

B.Tech. Scheme of Study (Branch: **Materials and Metallurgical Engineering)**

Admitted Batch 2025-26 Onwards

MM(4251 – 4256)	Department Elective-5(A)
MM 4251	Waste Derived Carbon and Energy Materials
MM 4252	X-ray and electron Microscopy
MM 4253	Shape Memory Alloys
MM 4254	Sustainable Metal Design
MM 4255	Polymer Derived Ceramics
MM 4256	Mechanics of Materials

MM(4261 – 4266)	Department Elective-6(A)
MM 4261	Advanced Materials and Processes
MM 4262	Welding Inspection and Quality Control
MM 4263	Numerical Heat Transfer and Fluid Flow
MM 4264	Introduction To Quantum Mechanics
MM 4265	Phase Field Modelling
MM 4266	Laser Technology



Table 1: Different category of course in B. Tech. Scheme of study Branch.....MME.....

S. No.	Category	I& II Sem	III Sem	IV Sem	V Sem	VI Sem	VII Sem	VIII Sem	Credit Breakup	Credit (%)
1	Humanities and Social Sciences including Management courses		1	1	0	0	0	1	9	5.45
2	Basic Science courses		0	0	0	0	0	0	0	0
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.		0	0	0	0	0	0	0	0
4	Professional core courses		5	5	5	4	1	0	65	39.39
5	Departmental Electives Courses relevant to chosen specialization / branch		0	0	1	1	2	2	18	10.9
6	Open subjects – Electives from other technical and /or emerging subjects		0	0	0	0	0	1	3	1.81
7	Project work, seminar and internship in industry or elsewhere		0	0	1	0	2	1	12	7.27
8	Laboratory Courses		4	3	3	3	1	1	16	9.69
		41							165	
NCC		0	7	3	7	3	0	0		