

Maulana Azad National Institute of Technology, Bhopal - 462003
DEPARTMENT OF MATERIALS AND METALLURGICAL ENGINEERING
SCHEME FOR B. TECH (Materials and Metallurgical Engineering) 2024 Revised

First Year Credits (Cumulative) 45

THIRD SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH24231	Mathematics-3	3	1	-	4
HUM24251	Fundamentals of Entrepreneurship	3	-	-	3
MME24211	Fundamentals of Metal Extraction	3	-	-	3
MME24212	Thermodynamics of Materials	3	-	-	3
MME24213	Physics of Materials	3	-	-	3
MME24214	Physical Metallurgy	3	-	-	3
MME24215	Metal Extraction Lab	-	-	2	1
MME24216	Metallography Lab	-	-	2	1
MME24217	Physical Property Measurement Lab	-	-	2	1
MME24218	Professional Practices	-	2	-	2
Total Hours =27		18	3	6	24
Total Credits (Cumulative)					69
Additional Subject: - National Cadet Corps (NCC)					
NCC24251	National Cadet Corps III	1	5	1	7
Total Credits (Cumulative)					11

FOURTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH24241	Mathematics-4	3	-	-	3
MME24221	Iron & Steel Making	3	1	-	4
MME24222	Mechanical Behavior of Materials	3	-	-	3
MME24223	Casting and Solidification	3	-	-	3
MME24224	Transport Phenomena	3	-	-	3
MME24225	Introduction to Machine Learning	2	1		3
MME24226	Materials Testing Lab	-	-	2	1
MME24227	Foundry Lab.	-	-	2	1
MME24228	Project Based Lab-1	-	-	2	1
Total Hours =25		17	2	6	22
Total Credits (Cumulative)					91
Additional Subject: - National Cadet Corps (NCC)					
NCC24252	National Cadet Corps IV	2	-	1	3
Total Credits (Cumulative)					14

FIFTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MME24311	Phase Transformation and Heat Treatment	3	1	-	4
MME24312	Materials Characterization	3	-	-	3
MME24313	Welding and Joining Technology	3	-	-	3
MME24314	Corrosion Science and Engineering	3	-	-	3
	Programme Elective -1(A)	3	-	-	3
MME24315	Metal Joining and Heat Treatment Lab	-	-	2	1
MME24316	Materials Characterization Lab	-	-	2	1
MME24317	Corrosion Lab	-	-	2	1
MME24318	Internship / Industrial Training	-	-	2	1
MME24319	Industrial Management	3	-	-	3
Total Hours =27		18	1	8	23
Total Credits (Cumulative)					114
Additional Subject: - National Cadet Corps (NCC)					
NCC24351	National Cadet Corps V	1	5	1	7
Total Credits (Cumulative)					21

SIXTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
CS2 4 352	Data Structures and Algorithm	3	1	-	4
MME24321	Metal Forming	3	1	-	4
MME24322	Ceramic Science and Technology	3	-	-	3
MME24323	Non-Ferrous Metal Extraction	3	-	-	3
	Programme Elective-2(A)	3	-	-	3
MME24324	Metal Forming Lab	-	-	2	1
MME24325	Ceramics and Powder Metallurgy Lab	-	-	2	1
MME24326	Process Metallurgy Lab	-	-	2	1
MME24327	Project-1			4	2
Total Hours =27		15	2	10	22
Total Credits (Cumulative)					136
Additional Subject: - National Cadet Corps (NCC)					
NCC24352	National Cadet Corps VI	2	-	1	3
Total Credits (Cumulative)					24

SEVENTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
HUM24451	Engineering Economics and IPR	3	-	-	3
MME24411	Fracture and Failure Analysis	3	-	-	3
	Programme Elective-3 (A)	3	-	-	3
	Programme Elective-4 (A)	3	-	-	3
	Open Elective-1(C)	3	-	-	3
MME24412	Failure Analysis Lab	-	-	2	1
MME24413	Project Based Lab - 2	-	-	4	2
MME24414	Industrial / Field Training	-	-	2	1
Total Hours =23		15	-	8	19
Total Credits (Cumulative)					155

EIGHTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
	Programme Elective-5 (A)	3	-	-	3
	Programme Elective-6 (A)	3	-	-	3
MME24421/ MME24422	Project-2 / Internship	-	-	16	8
MME24423	General Proficiency	-	-	-	1
Total Hours =22		6	-	16	15
Total Credits (Cumulative)					170

LIST OF PROGRAMME ELECTIVES (GROUP A)

Programme Electives 1(A) (3rd Year)

Course Code	Course Name
MME24351	Polymer Engineering
MME24352	Destructive and Non-Destructive Testing
MME24353	Advanced Steel Making
MME24354	Welding Metallurgy
MME24355	Selection and Design of Materials
MME24356	Composite Materials
MME24357	X-ray and Electron Microscopy
MME24358	Introduction to Quantum Mechanics

Programme Electives 2(A) (3rd Year)

Course Code	Course Name
MME24360	Magnetism and Optoelectronic Devices
MME24361	Metallurgical and Electronic Waste Recycling
MME24362	Surface Treatment Technologies
MME24363	Rare Earth Metallurgy
MME24364	Light Weight Metals and Alloys
MME24365	Application of AI and ML in Materials Science

Programme Electives 3(A) (4th Year)

Course Code	Course Name
MME24451	Additive Manufacturing
MME24452	Biomaterials
MME24453	Nuclear Materials
MME24454	Extraction of Rare Earth Metals and Alloys
MME24455	Utilization of Industrial Wastes
MME24456	Powder Processing of Materials
MME24457	Semiconductor Devices
MME24458	Advanced Ceramic Materials

Programme Electives 4(A) (4th Year)

Course Code	Course Name
MME24459	Advanced Manufacturing Technology
MME24460	High Temperature Materials
MME24461	Nanomaterials
MME24462	Advanced Magnetic Materials and their Applications
MME24463	Advanced Metal Forming Techniques
MME24464	Functional Materials
MME24465	Advanced Joining Technologies
MME24466	Surface Engineering

Programme Electives 5(A) (4th Year)

Course Code	Course Name
MME24467	Light Weight Metallic Materials
MME24468	Tribology
MME24469	Non-equilibrium Processing of Materials
MME24470	Advanced Materials and Processes
MME24471	Advanced Characterization Techniques
MME24472	Energy storage materials
MME24473	Plasma processing of materials

Programme Electives 6(A) (4th Year)

Course Code	Course Name
MME24474	Fuel furnaces and refractoriness
MME24475	Weld design and inspection
MME24476	Optical, Electronics and Magnetic Materials
MME24477	Physical metallurgy of alloy steels
MME24478	Advanced Casting and Solidification
MME24479	Polymer Derived Ceramics
MME24480	Mathematical Computing for Metallurgist