MATERIALS & METALLURGICAL ENGINEERING

Courses/Credit Distribution of Materials & Metallurgical Engineering Department

I. Basic Science Courses (BSC)

Semester I					
Course code	**Course name**	**L**	**T**	**P**	**Credits**
MAN101	Mathematics-I				
CHN104	Physical Chemistry	3	0	3	4
Semester II					
Course code	**Course name**	**L**	**T**	**P**	**Credits**
MAN103	Probability and Statistics	3	1	0	4
PYN102	Condensed Matter Physics	3	1	0	4

II. Engineering Science Courses (ESC)

Semester II					
Course code	**Course name**	**L**	**T**	**P**	**Credits**
ESC101	Engineering Drawing	2	0	4	4
Semester III					
Course code	**Course name**	**L**	**T**	**P**	**Credits**
ESC205	Introduction to Electronics	3	1	0	4
Semester IV					
ESC207	Introduction to Mechatronics	3	0	2	4

III. Departmental Core Courses (DCC)

Course code	**Course name**	**L**	**T**	**P**	**Credits**
MTN101	Introduction to Materials & Metallurgical Engineering	2	0	0	2
MTN102	Physical Metallurgy	3	1	2	4
MTN103	Thermodynamics of Materials	3	1	0	4
MTN201	Extractive Metallurgy for Non Ferrous Metals	3	1	0	4
MTN202	Electro Metallurgy & Corrosion	3	0	2	4
MTN203	Phase Transformations	3	1	0	4
MTN204	Ceramics	3	0	2	4
MTN205	Technical Communication	1	0	2	2
MTN206	Engineering Analysis and Design	3	1	0	4
MTN207	Mechanical Behavior of Materials	3	1	0	4
MTN208	Metal Casting	3	1	2	5
MTN209	Iron Making Technology	3	1	0	4
MTN210	Polymer Technology	3	1	0	4
MTN301	Steel Making Technology	3	0	2	4
MTN302	Materials Characterization	3	0	2	4
MTN303	Mechanical Working of Metals	3	1	0	4
MTN304	Engineering Materials and Selection	3	1	0	4
MTN305	Materials Joining Technology	3	1	0	4

IV. Departmental Elective courses (DEC)

Group-I

Any one of following:

Course code	**Course name**	**L**	**T**	**P**	**Credits**
MTN401	Kinetics & Rate Processes	3	1	0	4
MTN402	Electro-ceramics	3	1	0	4
MTN403	Advanced Foundry Technology	3	1	0	4
MTN404	Thin Film Technology	3	1	0	4

Group-II

Any one of following:

Course code	Course name	L	T	P	Credits
MTN405	Failure Analysis	3	0	2	4
MTN406	Heat Treatment of Metals	3	0	2	4
MTN407	Alloy Steels	3	0	2	4
MTN408	Cast Iron Technology	3	0	2	4

Group-II

Any one of following:

Course code	Course name	L	T	P	Credits
MTN409	Surface Engineering	3	1	0	4
MTN410	Nano Materials Technology & Applications	3	1	0	4
MTN411	Powder Metallurgy	3	1	0	4

*****Offering of discipline specializations under Group 2 of Elective Courses is optional.

V. Open elective Courses (OEC)

Course code	Course name	L	T	P	Credits
MTN302	Materials Characterization	3	1	0	4
MTN304	Engineering Materials & Selection	3	1	0	4
MTN461	Metallurgy & Heat Treatment	3	1	0	4
MTN462	Fracture & Failure Analysis	3	1	0	4

VI. Departmental Honors Courses (DHC)

Course code	Course name	L	T	P	Credits
MTN421	Advanced Materials	3	1	0	4
MTN422	Composite Materials	3	1	0	4
MTN423	Non Destructive Testing	3	1	0	4
MTN424	Microscopy & Spectroscopy	3	1	0	4
MTN425	X-ray Crystallography	3	1	0	4

VII. Minor Specialization Courses (MSC)

Course code	Course name	L	T	P	Credits
MTN431	Material Science & Engineering	3	0	2	4
MTN302	Materials Characterization	3	0	2	4
MTN432	Engineering Materials	3	0	2	4
MTN433	Corrosion Engineering	3	0	2	4
MTN406	Heat Treatment of Metals	3	0	2	4

TEACHING SCHEME FOR FIRST YEAR B.E. MATERIALS & METALLURGICAL ENGINEERING

SEMESTER -I

Course Code	Course Name	Credit	Category
MAN101	Mathematics –I	4	BSC
MTN101	Introduction to Materials & Metallurgical Engineering	2	DCC
CSN104/105	Computer Programming (Basic/ Advanced)	4	ESC
CHN104	Physical Chemistry	4	BSC
HSS101	Ethics and Self-Awareness	2	HSSC
GSC101	Environmental Sciences	3	GSC
	Total	**19**	

SEMESTER -II

Course Code	Course Name	Credit	Category
MAN103	Probability and Statistics	4	BSC
HSS(102/103)	Communication Skills (Advanced	2	HSSC
PYN102	Condensed Matter Physics	4	BSC
ESC101	Engineering Drawing	4	ESC
MTN102	Physical Metallurgy	4	DCC
MTN103	Thermodynamics of Materials	4	DCC
	Total	**22**	

Workshop project in summer vacation.	MTN 104	**56 hrs**	**2***

*Evaluation marks to be carried over to next semester.

Second Year

SEMESTER -I

Course Code	Course Name	Credit	Category
ESC 205	Introduction to Electronics	4	ESC
MTN 201	Extractive Metallurgy for Non Ferrous Metals	4	DCC
MTN 202	Electro Metallurgy & Corrosion	4	DCC
MTN 203	Phase Transformations	4	DCC
MTN 204	Ceramics	4	DCC
	Economics	3	HSSMEC
MTN 205	Technical Communication	2	DCC
	Total	25	

SEMESTER –II

Course Code	Course Name	Credit	Category
MTN 206	Engineering Analysis and Design	4	DCC
	Introduction to Mechatronics	4	ESC
MTN 207	Mechanical Behavior of Materials	4	DCC
MTN 208	Metal Casting	4	DCC
MTN 209	Iron Making Technology	4	DCC
MTN 210	Polymer Technology	4	DCC
MTN 221	Educational Tour	Non-credit	DCC
	Total	**24**	

Third Year

SEMESTER –I

Course Code	Course Name	Credit	Category
MTN 301	Steel Making Technology	4	DCC
MTN 302	Materials Characterization	4	DCC
MTN 303	Mechanical Working of Metals	4	DCC
MTN 304	Engineering Materials and Selection	4	DCC
MTN 305	Materials Joining Technology	4	DCC
MTN 321	Minor Project	4	DCC
	Total	**24**	

SEMESTER –II

Course Code	Course Name	Credit	Category
MTN 331	Internship*	20	DCC
		20	

*Internship Seminar presentations may be held a week before the date of Registration in Semester-I, Fourth Year.

Fourth Year

Semester-I

Course Code	Subject	Credit	Category
	Open Elective	4	GSEC/MEC
	Department Elective course-I	4	DEC
	Department Elective course-II	4	DEC
MTN 441	Major Project	2	DCC
MTN 431 MTN 421	Material Science & Engineering Advanced Materials	4	MSC/DHC
MTN 302 MTN 422	Materials Characterization Composite Materials	**4**	MSC/DHC
	Total	**14/22**	

Semester-II

Course Code	Subject	Credit	Category
	Entrepreneurship and Project Management	3	HSSMEC
	Department Elective course-III	4	DEC
MTN 451	Major Project	6	DCC
MTN 432 MTN 423	Engineering Materials Non Destructive Testing	4	MSC/DHC
MTN 433 MTN 424	Corrosion Engineering Microscopy and Spectroscopy	4	MSC/DHC
MTN 406 MTN 425	Heat Treatment of Metals X-Ray Crystallography	4	MSC/DHC
	Total	**13/25**	

COURSES OFFERED BY APPLIED SCIENCE DEPARTMENT TO ALL DEPARTMENTS

I. Departmental Elective courses (DEC)

Group-I

Course code	Course name	L	T	P	Credits
CHN 401	Modern Instrumental Methods Of Chemical Analysis	3	1	0	4
PYN 401	Advanced Physics	3	1	0	4
PYN 402	Crystal Physics	3	1	0	4
PYN 403	Solid State Physics	3	1	0	4
MAN 401	Operation Research	3	1	0	4
MAN 402	Optimization Techniques	3	1	0	4

II. Minor Specialization Courses For 7th Semester

Course Code	Course Name	L	T	P	Credits
Humanities Section					
HSM 401	Principles of Management	2	2	0	4
HSM 402	Business Environment and Business Laws	2	2	0	4
HSM 431	Managing Innovation and Change	2	2	0	4
Chemistry Section					
CHN 431	Inorganic Chemistry	3	0	3	4
CHN 432	Organic Chemistry	3	0	3	4
Physics Section					
PYN 431	Quantum Mechanics	3	1	0	4
PYN 432	Statistical Physics	3	1	0	4
Mathematics Section					
MAN 431	Algebra	3	1	0	4
MAN 432	Number Theory	3	1	0	4

Minor Specialization Courses For 8th Semester

Course Code	Course Name	L	T	P	Credits
Humanities Section					
HSM 404	Financial Management	2	2	0	4
HSM 405	Marketing Management	2	2	0	4
HSM 406	Human Resource Management	2	2	0	4
HSM 432	Business Research	2	2	0	4
Chemistry Section					
CHN 433	Physical Chemistry / Analytical Chemistry	3	1	0	4
CHN 434	Environmental Chemistry	3	1	0	4
CHN 435	Recent Advances in Chemical Sciences	3	1	0	4
Physics Section					
PYN 433	Nuclear Physics	3	1	0	4
PYN 434	Experimental Nuclear Physics	3	1	0	4
PYN 435	X-Ray Crystallography	3	1	0	4
Mathematics Section					
MAN 433	Fourier Series and Integral Transforms	3	1	0	4
MAN 434	Calculus of Variations	3	1	0	4
MAN 435	Algebraic Coding Theory	3	1	0	4