

UG Course Structure for Metallurgical Engineering (2021)

B. Tech. First Semester Programs

UG-CRC	Course Code	Course Name	L-T-P			Credits
IS.PHY101.14	PHY101	Physics – I: Classical, Quantum & Relativistic Mechanics	3	1	2	13
IS.CY101.14	CY101	Chemistry – I	2	1	2	10
IS.MA101.14	MA101	Engineering Mathematics – I	3	1	0	11
IE.ME103.14	ME103	Engineering Thermodynamics	3	1	0	11
EP.ME105.14	ME105	Manufacturing Practices– I	0	0	3	3
EP.ME104.14	ME104	Engineering Drawing	1	0	3	6
IH.H101.14	H101	Universal Human Values – I: Self and Family	1	1	0	5
		Total	13	5	10	59
LM.HL101.14	HL101	Basic English*	2	0	1	7
		Total	15	5	11	66
GY.PE101.14	PE101	Elementary Physical Education	0	1	3	5

Course Structure for B. Tech. Second Semester Programs

UG-CRC	Course Code	Course Name	L-T-P			Credits
IS.MA102.14	MA102	Engineering Mathematics – II	3	1	0	11
IE.CSO101.14	CSO101	Computer Programming	3	1	2	13
DC.MT101.14	MT101	Introduction to Metallurgy and Materials Engineering	2	0	0	6
DC.MT102.14	MT102	Metallurgical Thermodynamics and Kinetics	3	1	0	11
EP.ME106.14	ME106	Manufacturing Practices – II	0	0	3	3
EP.MT103.15	MT103	Metallurgical Practices – I	0	0	3	3
IH.H103.14	H103	Development of Societies	2	1	0	8
IH.H104.14	H104	History and Civilization				
IH.H105.14	H105	Philosophy				
IH.H106.14	H106	Education and Self				
		Total	13	4	8	55
GY.PE101.14	PE101	Elementary Physical Education #	0	1	3	5
GY. CPXXX.14	CPXXX	Creative Practice#				

Course Structure for B. Tech. Third Semester Programs

UG-CRC	Course Code	Course Name	L-T-P			Credits
			L	T	P	
IS.MA201.14	MA201	Numerical Techniques	3	1	0	11
IE.EO102.14	EO102	Fundamentals of Electronics and Instrumentation Engineering	3	1	2	13
DC.MT201.14	MT201	Structure of Materials	3	1	0	11
DC.MT202.15	MT202	Principles of Extractive Metallurgy	3	0	0	9
DC.MT203.15	MT203	Extractive Metallurgy Practical	0	0	3	3
IH.H103.14	H103	Development of Societies	2	1	0	8
IH.H104.14	H104	History and Civilization)/				
IH.H105.14	H105	Philosophy				
IH.H106.14	H106	Education and Self				
DP.MT291.15	MT291	Exploratory Project	0	0	5	5
Total			14	4	13	60
GY.CPXXX.14	CPXXX	Creative Practice #	0	1	3	5

Course Structure for B. Tech. Fourth Semester Programs

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
				L	T	P	
IS. MA203.14	MA203		Mathematical Methods	3	1	0	11
IE.MO102.14	MO102		Transport Phenomena	3	1	0	11
DC.MT204.15	MT204		Phase Diagrams	3	0	0	9
DC.MT205.15	MT205		Transport Phenomena Practical	0	0	3	3
DC.MT211.15	MT211	1	Iron Making Technologies	3	0	0	9
DC.MT221.15	MT221	2	Metallography Techniques	3	0	0	9
DC.MT222.15	MT222	2	Metallography Techniques Practical	0	0	3	3
IH.H201.14	H201		Universal Human Values – II: Self, Society and Nature	1	1	0	5
Total				16	3	6	60
DP.MT291.15	MT291		Exploratory Project (only for 2014 Batch)	0	0	5	5
GY.			Hobbies and Club	0	1	3	5

Course Structure for B. Tech. Fifth Semester Programs

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
DC.MT301.15	MT301		Modelling and Simulation in Metallurgy	2	0	0	6
DC.MT302.15	MT302		Modelling and Simulation in Metallurgy Practical	0	0	3	3
DC.MT303.15	MT303		Deformation and Testing of Materials	3	0	0	9
DC.MT304.15	MT304		Materials Testing Practical	0	0	3	3
DC.MT321.15	MT321	2	Phase Transformations (for nonstream and stream 2)	3	0	0	9
DC.MT411.15	MT 411	1	Material Processing Technologies (for Stream I, from VII Sem)				
EP.MT413.15	MT413	1	Metallurgical Practices II: Materials Processing (for stream I, from VII Sem)	0	0	2	2
Department Elective I							
DE.MT305.15	MT305		Energy and Environment in Metallurgical Industries	3	0	0	9
DE.MT311.15	MT311	1	Fuels & Refractories*				
DE.MT322.15	MT322	2	Instrumental Analysis*				
OE.			OPEN ELECTIVE – I (preferential)	3	0	0	9
HU/LM			HU/LM-I	3	0	0	9
Total				17	0	6/8	57/59
DP.MT391.15	MT391		Stream Project (Hons.)	0	0	10	10
OE.MT306.15	MT306		Nuclear Metallurgy***	3	0	0	9

Course Structure for B. Tech. Sixth Semester Programs

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
DC.MT.307.15	MT307		Heat Treatment	2	0	0	6
DC.MT.308.15	MT308		Heat Treatment Practical	0	0	3	3
DC.MT414.15	MT414	1	Steel Making Technologies (for stream 1, from VIII Sem)	3	0	0	9
DC. MT323.15	MT323	2	Mechanical Behaviour of Materials (for non stream and stream 2)				
EP.MT415.15	MT415	1	Metallurgical Practices-III: Ferrous Metallurgy (for stream 1, from VIII sem)	0	0	3	3
Department Elective II							
DE.MT309.15	MT309		Advanced Processing Technologies	3	0	0	9
DE.MT312.15	MT312	1	Alternative Routes of Iron and Steel Making				
DE.MT324.15	MT324	2	Electronic and Magnetic Materials (for non stream and stream 2)*				
OE.			OPEN ELECTIVE – II	3	0	0	9
HU/LM			HU/LM-II	3	0	0	9
DP.MT392.15	MT392		UG Project or Stream Project	0	0	10	10
Total				14	0	13/16	55/58
OE.MT361.15	MT361**		Composite Materials***	3	0	0	9

Course Structure for B. Tech. Summer Term Programs

UG-CRC	Course Code	Course Name	L-T-P			Credits
DP.MT393.15	MT393	Industrial Training/Project/Internship	0	0	5	5
Total			0	0	5	5

Course Structure for B. Tech. Seventh Semester Programs

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
DC.MT.401.15	MT401		Non-Ferrous Extractive Metallurgy	2	0	0	6
DC.MT.411.15	MT411	1	Materials Processing Technologies (for non stream and stream 2)	3	0	0	9
DC.MT321.15	MT321	2	Phase Transformations (for Stream 1, from V Sem)				
EP.MT.412.15	MT412	1	Metallurgical Practices-II: Materials Processing (for non-stream and stream 2)	0	0	2	2
			Department Elective III				
DE.MT402.15	MT402		Wear, Friction and Lubrication	3	0	0	9
DE.MT413.15	MT413	1	Welding of Nonferrous Metals*				
DE.MT421.15	MT421	2	Non-metallic Materials*				
OE.			OPEN ELECTIVE III	3	0	0	9
HU/LM			HU/LM-III	3	0	0	9
DP.MT491.15	MT491		UG Project or Stream Project	0	0	10	10
			Total	14	0	12/14	52/54
OE.MT403.15	MT403		Materials Selection and Design ***	3	0	0	9

Course Structure for B. Tech. Eighth Semester Programs

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
DC.MT404.15	MT404		Corrosion and Prevention	2	0	0	6
DC.MT405.15	MT405		Electrometallurgy and Corrosion Practical	0	0	3	3
DC.MT414.15	MT414	1	Steel Making Technologies (for non stream and stream 2)	3	0	0	9
DC. MT323.15	MT323	2	Mechanical Behaviour of Materials (for Stream 1)				
EP.MT415.15	MT415	1	Metallurgical Practices-III: Ferrous Metallurgy (for non stream and stream 2)	0	0	3	3
			Department Elective IV				
DE.MT406.15	MT406		Cast Iron Technology	3	0	0	9
DE.MT416.15	MT416	1	Alloy Steel Production Technology*				
DE.MT422.15	MT422	2	Physical Metallurgy of Alloy steel*				
OE.			OPEN ELECTIVE IV	3	0	0	9
HU/LM			HU/LM IV	3	0	0	9
			Total	14	0	6	45/48
DP.MT492.15	MT492		Stream Project (Hons.)	0	0	10	10
OE.MT407.15	MT407		Automotive and Aerospace Materials***	3	0	0	9

1. Summary sheet of programme components as attached

Credit Allocation for I SEM to VIII Sem for B Tech (Metallurgical Engineering) for the Students 2014-15- onwards

S.NO.	Cat.	Programme Components	4-year B. Tech. Programme	
			%(Min-Max Credits)	Number of Courses (9-13 Credits)
1	HU	Humanities and Social Science*	10 (41-50)	4-5
Dept allotted			(26)+	4
2	IS	Science*	15 (62-84)	6-7
Dept allotted			67	6
3	IE	Institute Requirement Engineering/ Pharmacy*	10 (41-60)	4-5
Dept allotted			(48)	4
4	EP	Engineering Drawing(Manual and Computer Aided), Manufacturing Practices and Practice course of Department/School*	5 (20-24)	2
Dept allotted			(20)	6
5	LM	Language and Management	5 (20-24)	2
Dept allotted			(36)+	4
6	DC/MC	Department/Programme Core (Includes Stream Courses)	25-30 (105-155)	10-13
Dept allotted			(154)	23
7	DE/BE	Department/Programme Elective (Includes Stream Courses)	7-10 (30-60)	3-5
Dept allotted			(36)	4
8	OE	Open Elective (Interdisciplinary Stream Courses from Science/Engineering/Pharmacy) (Room for Minor with some additional credits)	8-15 (35-70)	4-7
Dept allotted			(36)	4
9	DP	Project/Industrial Visit/Training	5-10 (20-50)	4-10 Units
Dept allotted			(30)	4
10	DT	Dissertation	-----	-----
Dept allotted				
		Total Credit requirement for graduation	(430-460)	
Dept allotted		Total (Regular)	453	59
Dept allotted		Total (Hons)	473	61

List of Department Electives

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
			Department Elective I (Sem V)				
DE.MT305.15	MT305.15		Energy and Environment in Metallurgical Industries	3	0	0	9
DE.MT311.15	MT311	1	Fuels & Refractories*				
DE.MT322.15	MT322	2	Instrumental Analysis*				
			Department Elective II (Sem VI)				
DE.MT309.15	MT309		Advanced Processing Technologies	3	0	0	9
DE.MT312.15	MT312	1	Alternative Routes of Iron and Steel Making				
DE.MT324.15	MT324	2	Electronic and Magnetic Materials(for non stream and stream 2)*				
			Department Elective III (Sem VII)				
DE.MT402.15	MT402		Wear, Friction and Lubrication	3	0	0	9
DE.MT413.15	MT413	1	Welding of Nonferrous Metals*				
DE.MT421.15	MT421	2	Non-metallic Materials*				
			Department Elective IV (Sem VIII)				
DE.MT406.15	MT406		Cast Iron Technology	3	0	0	9
DE.MT416.15	MT416	1	Alloy Steel Production Technology*				
DE.MT422.15	MT422	2	Physical Metallurgy of Alloy steel*				

List of Streams

Stream	Stream Code	Stream Title
PM	X1X	Process Metallurgy
PhM	X2X	Physical Metallurgy

List of Stream Core

UG-CRC	Course Code	Stream	Course Name	L-T-P			Credits
			Stream-I	3	0	0	9
DC.MT211.15	MT211	1	Iron Making Technologies (Sem IV)	3	0	0	9
DC.MT411.15	MT 411	1	Material Processing Technologies (Sem VII)	3	0	0	9
DC.MT412.15	MT412	1	Metallurgical Practices II: Materials Processing (Sem VII)	0	0	2	2
DC.MT414.15	MT414	1	Steel Making Technologies (Sem VIII)	3	0	0	9
EP.MT415.15	MT415	1	Metallurgical Practices-III: Ferrous Metallurgy (Sem VIII)	0	0	3	3
			Stream 2				
DC.MT221.15	MT221	2	Metallography Techniques (Sem IV)	3	0	0	9
DC.MT222.15	MT222	2	Metallography Techniques Practical (Sem IV)	0	0	3	3
DC.MT321.15	MT321	2	Phase Transformations (Sem V)	3	0	0	9
DC.MT323.15	MT323	2	Mechanical Behaviour of Materials (Sem VI)	3	0	0	9

List of Stream Electives

UG-CRC	Course Code		Course Name	L-T-P			Credits
			Stream-I	3	0	0	9
DE.MT311.15	MT311	1	Fuels & Refractories * (Sem V)	3	0	0	9
DE.MT312.15	MT312	1	Alternative Routes of Iron and Steel Making (Sem VI)	3	0	0	9
DE.MT413.15	MT413	1	Welding of Nonferrous Metals* (Sem VII)	3	0	0	9
DE.MT416.15	MT416	1	Alloy Steel Production Technology* (Sem VIII)	3	0	0	9
			Stream 2				
DE.MT322.15	MT322	2	Instrumental Analysis* (Sem V)	3	0	0	9
DE.MT324.15	MT324	2	Electronic and Magnetic Materials* (Sem VI)	3	0	0	9
DE.MT421.15	MT421	2	Non-metallic Materials* (Sem VII)	3	0	0	9
DE.MT422.15	MT422	2	Physical Metallurgy of Alloy Steel*(Sem VIII)	3	0	0	9

*Student can select any Elective course offered by a Department/School of the Institute and which is duly recommended by the Supervisor/Mentor of the student concerned.

1. List of open electives (to be offered for other departments): Department students can opt these as Department Electives

UG-CRC	Course Code		Course Name	L-T-P			Credits
OE.MT306.15	MT306		Nuclear Metallurgy (Sem V)	3	0	0	9
OE.MT361.15	MT361**		Composite Materials (Sem VI)	3	0	0	9
OE.MT403.15	MT403		Materials Selection and Design (Sem VII)	3	0	0	9
OE.MT407.15	MT407		Automotive and Aerospace Materials (Sem VIII)	3	0	0	9