Curriculum for B. Tech./Dual Degree in Metallurgical Engineering and Materials Science

For students admitted after 2007

(Changes in III, IV & V semester for 2007 batch given at the end)

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE

B.Tech.

	COURS	SE CUR	RICU	JLUM	FOR TH	E NEW PROGI	RAMME w.e.f. 2007 BATCH					
	Semester I						Semester – II					
Course code	Course Name	Cı	edit	Struct	ure	Course Code	Course Name	Credit Structur				
		L	T	P	C			L	T	P	С	
CH 103+ OR	Chemistry	2	1	0	6	CH 103* OR	Chemistry	2	1	0	6	
PH 103*	Electricity and Magnetism	2	1	0	6	PH 103+	Electricity and Magnetism	2	1	0	6	
CS 101	Computer Programming	2	0	2	6	MA 106@	Linear Algebra and	3	1	0	4	
						AND MA 108@	Differential Equations I	3	1	0	4	
HS 101	Economics	3	0	0	6	IC 102	Data Analysis and Interpretations	2	1	0	6	
MA 105	Calculus	3	1	0	8	MM 152	Materials and Technology	2	1	0	6	
CH 117+ OR	Chemistry Lab	0	0	3	3	CH 117* OR	Chemistry Lab	0	0	3	3	
PH 117*	Physics Lab	0	0	3	3	PH 117+	Physics Lab	0	0	3	3	
ME 113+ OR	Workshop Practice	0	1	3	5	ME 113* OR	Workshop Practice	0	1	3	5	
ME 119*	Engineering Graphics and Drawing	1	0	3	5	ME 119+	Engineering Graphics and Drawing	1	0	3	5	
										1		
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP	NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP	
NO 101#	National Sports Organization (NSO)	0	0	0	P/NP	NC 102#	National Sports Organization (NSO)	0	0	0	P/NP	
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP	NS 102#	National Service Scheme (NSS)	0	0	0	P/NP	
	batches, + D1 D2 batches						batches, + D1 D2 batches	*				
# Any one of	of these three P/NP courses, half semest	er each.				# Any one o	f these three P/NP courses @ Half	f semeste	er cour	ses		

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE B.Tech.(Contd.)

	COURSE C	URRI	CULUI	M FOR	R THE N	NEW PROGRA	AMME w.e.f. 2007 BATCH				
	Semester III						Semester – IV				
Course	Course Name	C	redit S	Structu	ire	Course	Course Name		Credit S	Structu	ire
code			1	1		Code			1		
		L	T	P	C			L	T	P	C
MM 201	Structure of Materials	2	1	0	6	MM 202	Thermodynamics of Materials	2	1	0	6
MM 203	Mechanics of Materials	2	1	0	6	ME 220	Theory of Machines and Machine	2	1	0	6
							Design				
EE 101	Intro. to Electrical Engg. & Electronics	3	1	0	8	MM 305	Kinetics of Processes	2	1	0	6
MM 204	Transport Phenomena	2	1	0	6	PH 105	Modern Physics	3	1	0	8
IC 211	Exptn. and Meas. Lab	0	0.5	3	4	EE 209	Electrical/ Electronics Lab.	0	0	3	3
						MM 212	Metallography and Structural	0	0.5	3	4
							Characterisation Lab.				
Total		9	5	6	30	Total		8	4	3	33
						COURSES	FOR HONORS REQUIREMENT				
COURSES	FOR HONORS REQUIREMENT (Elective	from t	he autu	ımn lis	t)						
MM 409	Colloid and Interface Science	2	1	0	6	MM 206	Experimental Techniques in Materials	2	1	0	6
	(suggested)						Science (Core)				
COURSES	FOR MINOR REQUIREMENT					COURSES	FOR MINOR REQUIREMENT		•		
MM 202	Thermodynamics of Materials (Core)	2	1	0	6	MM 201	Structure of Materials (Core)	2	1	0	6

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE B.Tech.(Contd.)

	COURSE C	CURRI	ICULU	M FO	R THE	NEW PROG	RAMME w.e.f. 2007 BATCH					
	Semester V						Semester – VI					
Course code	Course Name	C	Credit S	Structi	ıre	Course Code	Course Name		Credit Structure			
		L	T	P	C			L	T	P	C	
MM 357	Ceramics and Powder Metallurgy	2	1	0	6	MM 318	Electronic Properties of Materials.	2	1	0	6	
MM 301	Phase Transformations	2	1	0	6	MM 359	Metal Casting and Joining	2	1	0	6	
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6	MM 320	Process Metallurgy Principles	2	1	0	6	
MM 319	Mechanical Behaviour of Materials	2	1	0	6	MA 214	Introduction to Numerical Analysis	3	1	0	8	
MM 312	Heat Treatment Lab.	0	1	3	5	MM 322	Casting and Joining Lab.	0	0	1.5	1.5	
MM 362	Mech. Testing Lab.	0	0.5	1.5	2.5	MM 411	Manufacturing Processes Lab.	0	0	1.5	1.5	
						MM 396	Seminar (3 Credits)	0	0	3	3	
Total Cre	edits				31.5	Total Cred	lits				32	
COURSE	S FOR HONORS REQUIREMENT		1	4		COURSES	FOR HONORS REQUIREMENT	·				
	Elective from the autumn sem. list					MM 493	Elective from the spring sem. List or BTP I (6 credits)	0	0	6	6	
COURSE	S FOR MINOR REQUIREMENT					COURSES	FOR MINOR REQUIREMENT					
MM 318	Electronic Properties of Materials (Core) Prerequisite: MM 201: Structure of Materials (Not available for EP, they can take any elective from list)	2	1	0	6	MM 301	Phase Transformations (Core) Prerequisite: MM 202: Thermodynamics of Materials	2	1	0	6	

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE B.Tech. (Contd.)

	COURSE	CURRIC	CULU	M FOI	R THE	NEW PROGE	RAMME w.e.f. 2007 BATCH					
	Semester VII						Semester – VIII					
Course code	Course Name	C	redit S	Structu	ire	Course Code	Course Name C			Credit Structure		
		L	T	P	C			L	T	P	C	
MM 401	Introduction to Process Control Theory and Instrumentation	2	1	0	6	MM 454	Corrosion and Protection of Materials	2	1	0	6	
MM 453	Engineering Polymers and Composites	2	1	0	6		Departmental Elective I #	2	1	0	6	
MM 304	Iron and Steel Making	2	1	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg	3	0	0	3	
						115 200	Environmental Studies	3	0	0	3	
	Institute Elective I	2	1	0	6		Institute Elective II	2	1	0	6	
						MM 426	Equipment and Processes Des. Lab.	0	2	2	6	
MM 419	Computation and Controls Lab.	0	1	3	5	MM 462	Corrosion and Protection Lab.	0	0	1.5	1.5	
MM 433	Manufacturing Process Seminar	0	0	3	3	MM 448	Thin Films Lab.	0	0	1.5	1.5	
MM 388	Practical Training	PP/ NP										
Total Cre	dits				32	Total Cred	lits				33	
Total Cre # Departm 1. MM 40	dits nental Elective I:	2 1 0 c	-		32	Total Cred	lits					

COURSE	S FOR HONORS REQUIREMENT		
MM 494 MM 493 E	Elective from the autumn sem. List or BPT II (6 credits) or BTP I if not done earlier		
COURSE	S FOR MINOR REQUIREMENT		
	Elective courses from list: at least one will be placed in slot 5		6

COURSES	FOR HONORS REQUIREMENT		
	Elective from the spring sem. List or		
MM 494	BTP II if not done earlier		
COURSES	FOR MINOR REQUIREMENT		
	Elective courses from list: at least one will be placed in slot 5		6

Minor in Metallurgical Engineering and Materials Science Total of 5 courses (four core and one elective) adding upto 30 credits minimum.

Core:

1)	MM 202 Thermodynamics of Materials	2 1 0 6
2)	MM 201 Structure of Materials	2 1 0 6

3) MM 302 Electronic Properties of Materials 2 1 0 6

(Prerequisite: MM 201 Structure of Materials) (Not available for EP students)

4) MM 303 Phase Transformations 2 1 0 6

(Prerequisite: MM 202 Thermodynamics of Materials)

Electives (any one) have to be chosen from the following list.

Some of these are departmental core and some electives.

Core courses will run in core slots. At least one or two elective courses will be offered in slot 5 in each semester.

1)	MM 206 Experimental Techniques in Materials Science	(Honours Core)
2)	MM 301 Ceramics and Powder Metallurgy	(Deptl. Core)
3)	MM 307 Mechanical Behaviour of Matls.	(Deptl. Core)
4)	MM 304 Metal Casting and Joining	(Deptl. Core)
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5) MM 306 Process Metallurgy Principles (Deptl. Core)
 6) MM 405 Iron and Steel Making (Dept. Core)

7) MM 403 Engineering Polymers and Composites	(Deptl. Core)
8) MM 402 Corrosion and Protection of Matls.	(Deptl. Core)
9) MM 404 Mechanical Working of Metals	(Deptl. Core)
10) MM 406 Semiconductor Devices and Processing	(Deptl. Core)
11) MM 484 Solid Electrolytes	(Honours Elective)
12) MM 482 Non-destructive Evaluation	(Honours Elective)
13) MM 473 Electronic Ceramics	(Honours Elective)
14) MM 474 Science and Technology of Thin Eilms	(Hanayan Elastiva)

14) MM 474 Science and Technology of Thin Films (Honours Elective)
15) MM 457 Biomaterials (Honours Elective)

MM 6XX PG courses can be taken by those eligible to do so.

Honours for B.Tech. students in Metallurgical Engineering and Materials Science Course MM 206, and BTP I (6 credits) are mandatory. Additional 18 credits from elective courses and BTP II.

Autumn

- 1) MM 409 Colloid and Interface Science
- 2) MA 205/207 Complex Analysis+ Diff. Eqns. II
- 3) CE 102 Engineering Mechanics
- 4) BT251 Molecular Cell Biology
- 5) MM 473 Electronic Ceramics
- 6) MM 474 Science and Technology of Thin Films
- 7) MM 457 Biomaterials
- 8) BTP I (6 credits): not earlier than sixth semester (Core)
- 9) BTP II (6 credits): not earlier than seventh semester (prerequisite: minimum BB grade in BTP-I)

Spring

- 1) MM 206 Experimental Techniques in Materials Science (Core)
- 2) MM 486 Microprocessors in Control of Processes
- 3) MM 484 Solid Electrolytes
- 4) MM 482 Non-destructive Evaluation
- 5) MM 404 Mechanical Working
- 6) MM 406 Semiconductor Devices and Processing
- 7) MM 417 Entrepreneurship in Materials Science and Engineering
- 8) BTP I: not earlier than sixth semester
- 9) BTP II: not earlier than seventh semester (prerequisite: minimum BB grade in BTP-I)

MM 6XX PG courses can be taken by those eligible to do so, with instructor's consent.

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE Dual Degree

Two Specializations: 1. Ceramics and Composites 2. Metallurgical Process Engineering

Salient features:

- 1. The basic component of the B.Tech. Programme will be done by all the Dual Degree students.
- 2. In addition they will do
 - honours programme of 30 credits, all through courses, as mentioned under the section on honours below.
 - Four PG level courses, two of which are core specific to the specialization, and two electives from the list of PG electives currently running in the department.
 - A DDP of 72 credits, spread into I stage of 30 credits and II stage of 42 credits, in the 9th and the 10th semester respectively.
- 2. The total credit break up therefore is a follows:

B.Tech. Component: 258.5 credits
Honours: 30 credits
DD component 24+72 96 credits

Total 384.5 credits

Requirements for Honours for Dual Degree students

The content of the honours programme, which is mandatory, differs from that for B.Tech. students in the following ways:

- 1. BTP-I and BTP-II are not available to the dual degree students
- 2. Course can be taken from the list for honours, or any MM 6XX PG course from 5th semester onwards.

Dual Degree : Specialization: Ceramics and Composites

	COURSE C	CURRIC	ULU	JM FO	OR THE N	EW PROGRAM	MME w.e.f. 2007 BATCH				
	Semester I						Semester – II				
Course code	Course Name	(Credi	it Stru	cture	Course Code	Course Name		cture		
		L	T	P	С			L	Т	P	С
CH 103+	Chemistry	2	1	0	6	CH 103*	Chemistry	2	1	0	6
OR						OR					Ì
PH 103*	Electricity and Magnetism	2	1	0	6	PH 103+	Electricity and Magnetism	2	1	0	6
CS 101	Computer Programming	2	0	2	6	MA 106@	Linear Algebra and	3	1	0	4
						AND MA 108@	Differential Equations I	3	1	0	4
HS 101	Economics	3	0	0	6	IC 102	Data Analysis and Interpretations	2	1	0	6
MA 105	Calculus	3	1	0	8	MM 152	Materials and Technology	2	1	0	6
CH 117+	Chemistry Lab	0	0	3	3	CH 117*	Chemistry Lab	0	0	3	3
OR PH 117*	Physics Lab	0	0	3	3	OR PH 117+	Physics Lab	0	0	3	3
ME 113+ OR	Workshop Practice	0	1	3	5	ME 113* OR	Workshop Practice	0	1	3	5
ME 119*	Engineering Graphics and Drawing	1	0	3	5	ME 119+	Engineering Graphics and Drawing	1	0	3	5
NC 101#	National Cadat Corns (NCC)	0	0	0	P/NP	NC 102#	National Codat Come (NCC)	0	0	0	P/NP
NO 101#	National Cadet Corps (NCC) National Sports Organization (NSO)	0		0	P/NP P/NP	NC 102# NC 102#	National Cadet Corps (NCC) National Sports Organization (NSO)	0	0	0	P/NP P/NP
	* * *	0	0	0		NC 102# NS 102#		0	0	0	
NS 101#	National Service Scheme (NSS)	U	U	U	P/NP		National Service Scheme (NSS)	10	U	U	P/NP
	& D4 batches, + D1 D2 batches one of these three P/NP courses						batches, + D1 D2 batches f these three P/NP courses @ Half	semeste	r cour	ses	

Dual Degree : Specialization: Ceramics and Composites (Contd.)

	COURSE	CURRIC	CULUI	M FOR	THE I	NEW PROG	RAMME w.e.f. 2007 BATCH					
	Semester III						Semester – IV				-	
Course	Course Name	C	redit S	Structu	ire	Cours	ourse Course Name		Credit Structure			
code				1		Code	Code		<u> </u>			
		L	T	P	C			L	T	P	C	
MM 201	Structure of Materials	2	1	0	6	MM 20	2 Thermodynamics of Materials	2	1	0	6	
MM 203	Mechanics of Materials	2	1	0	6	ME 220	Theory of Machines and Machine Design	2	1	0	6	
EE 101	Introduction to Elect. Engineering & Electronics	3	1	0	8	MM 30	Kinetics of Processes	2	1	0	6	
MM 204	Transport Phenomena	2	1	0	6	PH 105	Modern Physics	3	1	0	8	
IC 211	Exptn. and Meas. Lab.	0	0.5	3	4	EE 209	Electrical/ Electronics Lab.	0	0	3	3	
						MM 21	Metallography and Structural Characterisation Lab.	0	0.5	3	4	
Total Cred	lits	9	5	6	30	Total C	redits	8	4	3	33	
											ļ	
COURSES	FOR HONORS REQUIREMENT (Electiv	e from t	he autu	ımn lis	t)	COURS	ES FOR HONORS REQUIREMENT					
	Honours 1	2	1	0	6	MM 20	Honours 2 Experimental Techniques in Materials Science (Core)	2	1	0	6	

Dual Degree : Specialization: Ceramics and Composites (Contd.)

	COURSE	CURRIC	ULUM	FOR	THE N	EW PROGRA	AMME w.e.f. 2007 BATCH				
	Semester V						Semester – VI				
Course code	Course Name	C	redit S	Structu	ire	Course Code	Course Name		Credit S	Structu	ire
		L	T	P	C			L	T	P	C
MM 357	Ceramics and Powder Metallurgy	2	1	0	6	MM 318	Electronic Properties of Materials	2	1	0	6
MM 301	Phase Transformations	2	1	0	6	MM 359	Metal Casting and Joining	2	1	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6	MM 320	Principles of Process Metallurgy	2	1	0	6
MM 319	Mechanical Behaviour of Materials	2	1	0	6	MA 214	Numerical Methods	3	1	0	8
MM 312	Heat Treatment Lab.	0	1	3	5	MM 322	Casting and Joining Lab.	0	0	1.5	1.5
MM 362	Mechanical Testing Lab.	0	0.5	1.5	2.5	MM 411	Manufacturing Processes Lab.	0	0	1.5	1.5
						MM 396	Seminar (3 Credits)	0	0	3	3
Total Credits		8	4.5	3	31.5	Total Cred	lits	8	4.5	6	32
COURSES FO	OR HONORS REQUIREMENT Elective	from the	autumi	n sem.	List	COURSES	FOR HONORS REQUIREMENT Electiv	ve from	the sprii	ng sem.	List
	DURSES FOR HONORS REQUIREMENT Elective from the autumn sem. Li Honours 3						Honours 4				6

Dual Degree : Specialization: Ceramics and Composites (Contd.)

COURSE C	URRIC	ULUM	1 FOR	THE N	IEW PROGRA	AMME w.e.f. 2007 BATCH				
Semester VII						Semester – VIII				
Course Name	C	redit S	Structi	ıre	Course Code	Course Name	(Credit S	Structu	re
	L	T	P	C			L	T	P	C
Instrumentation & Process Control Theory and Instrumentation	2	1	0	6	MM 454	Corrosion and Protection of Materials	2	1	0	6
Engineering Polymers and Composites	2	1	0	6	MM 406	Semiconductor Devices and Processing	2	1	0	6
Iron and Steel Making	2	1	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg And	3	0	0	3
						Environmental Studies	3	0	0	3
					MM 652	Advanced Ceramics	3	0	0	6
Institute Elective I	2	1	0	6		Institute Elective II	2	1	0	6
					MM 426	Equipment and Processes Design Lab.	0	2	2	6
Computation and Controls Lab.	0	1	3	5	MM 462	Corrosion and Protection Lab.	0	0	1.5	1.5
Manufacturing Process Seminar	0	0	3	3	MM 448	Thin Films Lab.	0	0	1.5	1.5
Practical Training		PP	/NP							
its	8	5	3	32	Total Cred	lits	9	6	5	39
FOR HONORS REQUIREMENT Elective	from th	e autur	nn sen	n. List			•	•		
Honours 5				6						
	Semester VII Course Name Instrumentation & Process Control Theory and Instrumentation Engineering Polymers and Composites Iron and Steel Making Institute Elective I Computation and Controls Lab. Manufacturing Process Seminar Practical Training its FOR HONORS REQUIREMENT Elective	Semester VII Course Name Curse Name L Instrumentation & Process Control Theory and Instrumentation Engineering Polymers and Composites Iron and Steel Making 2 Institute Elective I Computation and Controls Lab. Manufacturing Process Seminar Practical Training its 8 FOR HONORS REQUIREMENT Elective from the	Semester VII Course Name Credit S L T Instrumentation & Process Control Theory and Instrumentation Engineering Polymers and Composites Iron and Steel Making Institute Elective I Computation and Controls Lab. Manufacturing Process Seminar Practical Training PP Its Course Name Credit S L T 2 1 1 Composites 2 1 Institute Elective I 2 1 Computation and Controls Lab. Practical Training PP Its FOR HONORS REQUIREMENT Elective from the auture	Course Name	Course Name	Course Name	Course Name Credit Structure Course Code	Course Name Credit Structure Course Name Course Na	Course Name Credit Structure Course Name Credit Structure Code Structure Code Course Name Credit Structure Code Course Name Credit Structure Code Structure Code Course Name Credit Structure Code Structure Course Name Credit Structure Code Course Name Credit Structure Course Name Course Name	Course Name

Dual Degree : Specialization: Ceramics and Composites (Contd.)

	COURSE CURR	ICULU.	M FO	R THE	NEW PI	ROGRAMME (L	Dual Degree.) w.e.f. 2007 BATCH				
	Semester IX						Semester – X				
Course code	Course Name	(Credit	Struct	ure	Course Code	Course Name		Credi	t Struc	ture
		L	T	P	C			L	T	P	C
MM 654	Advanced Composites	3	0	0	6		DD Elective II	3	0	0	6
	DD Elective I	3	0	0	6	MM 594	DDP Stage II				42
MM 593	DDP Stage I				30						
Total Credits			42	2		Total Credi	ts			48	

Dual Degree : Specialization: Metallurgical Process Engineering

	COURSE C	CURRIC	CULU	JM F	OR THE N	EW PROGRAM	MME w.e.f. 2007 BATCH					
	Semester I						Semester – II					
Course code	Course Name	(Credi	it Stru	cture	Course Code	Course Name	Credit Structur				
		L	T	P	С			L	T	P	C	
CH 103+ OR	Chemistry	2	1	0	6	CH 103* OR	Chemistry	2	1	0	6	
PH 103*	Electricity and Magnetism	2	1	0	6	PH 103+	Electricity and Magnetism	2	1	0	6	
CS 101	Computer Programming	2	0	2	6	MA 106@	Linear Algebra and	3	1	0	4	
						AND MA 108@	Differential Equations I	3	1	0	4	
HS 101	Economics	3	0	0	6	IC 102	Data Analysis and Interpretations	2	1	0	6	
MA 105	Calculus	3	1	0	8	MM 152	Materials and Technology	2	1	0	6	
CH 117+ OR	Chemistry Lab.	0	0	3	3	CH 117* OR	Chemistry Lab.	0	0	3	3	
PH 117*	Physics Lab.	0	0	3	3	PH 117+	Physics Lab.	0	0	3	3	
ME 113+	Workshop Practice	0	1	3	5	ME 113*	Workshop Practice	0	1	3	5	
OR						OR						
ME 119*	Engineering Graphics and Drawing	1	0	3	5	ME 119+	Engineering Graphics and Drawing	1	0	3	5	
27.00.11						2201025						
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP	NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP	
NO 101#	National Sports Organization (NSO)	0	0	0	P/NP	NC 102#	National Sports Organization (NSO)	0	0	0	P/NP	
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP	NS 102#	National Service Scheme (NSS)	0	0	0	P/NP	
	batches, + D1 D2 batches						batches, + D1 D2 batches					
# Any one of	these three P/NP courses					# Any one of these three P/NP courses @ Half semester courses						

$\textbf{Dual Degree: Specialization:} \ \textbf{Metallurgical Process Engineering} (\ \textbf{Contd.})$

	COURSE C	CURRIC	CULUI	M FOR	THE I	NEW PROGRA	AMME w.e.f. 2007 BATCH				-
	Semester III						Semester – IV				
Course code	Course Name	C	redit S	Structu	ire	Course Code	Course Name	•	Credit S	Structu	ire
		L	Т	P	С			L	T	P	С
MM 201	Structure of Materials	2	1	0	6	MM 202	Thermodynamics of Materials	2	1	0	6
MM 203	Mechanics of Materials	2	1	0	6	ME 220	Theory of Machines and Machine Design	2	1	0	6
EE 101	Introduction to Electrical Engineering & Electronics	3	1	0	8	MM 305	Transport Phenomena	2	1	0	6
MM 204	Transport Phenomena	2	1	0	6	PH 105	Modern Physics	3	1	0	8
IC 211	Exptn. and Meas. Lab	0	0.5	3	4	EE 209	Electrical/ Electronics Lab.	0	0	3	3
						MM 212	Metallography and Structural Characterization Lab.	0	0.5	3	4
Total Cred	lits	9	5	6	30	Total Cree	dits	8	4	3	33
COURSES	FOR HONORS REQUIREMENT (Elective	from t	he autu	ımn lis	t)	COURSES	S FOR HONORS REQUIREMENT				
	Honours 1	2	1	0	6	MM 206	Honours 2 Experimental Techniques in Materials Science (Core)	2	1	0	6

Dual Degree : Specialization: Metallurgical Process Engineering(Contd.)

	COURSE	CURRIC	ULUM	FOR	THE N	EW PROGR	AMME w.e.f. 2007 BATCH				
	Semester V						Semester – VI				
Course code	Course Name	C	Credit S	tructu	ıre	Course Code	Course Name	Credit Struc			ire
		L	T	P	C			L	T	P	C
MM 357	Ceramics and Powder Met.	2	1	0	6	MM 318	Electronic Properties of Materials	2	1	0	6
MM 301	Phase Transformations	2	1	0	6	MM 359	Metal Casting and Joining	2	1	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6	MM 320	Principles of Process Metallurgy	2	1	0	6
MM 319	Mechanical Behaviour of Materials	2	1	0	6	MA 214	Numerical Methods	3	1	0	8
MM 312	Heat Treatment Lab.	0	1	3	5	MM 322	Casting and Joining Lab.	0	0	1.5	1.5
MM 362	Mechanical Testing Lab.	0	0.5	1.5	2.5	MM 411	Manufacturing Processes Lab.	0	0	1.5	1.5
						MM 396	Seminar (3 Credits)	0	0	3	3
Total Credits		8	4.5	3	31.5	Total Cree	dits	8	4.5	6	32
COURSES FO	DR HONORS REQUIREMENT Elective Honours 3	from the	autumr	n sem.	List 6	COURSES	FOR HONORS REQUIREMENT Election Honours 4	ive from	the spri	ng sem.	List 6

Dual Degree : Specialization: Metallurgical Process Engineering(Contd.)

	COURSE C	CURRIC	ULUN	1 FOR	THE N	EW PROGRA	AMME w.e.f. 2007 BATCH				
	Semester VII						Semester – VIII				
Course code	Course Name	C	redit S	Structu	ıre	Course Code	Course Name	(Credit S	Structu	re
		L	T	P	C			L	T	P	C
MM 401	Instrumentation & Process Control	2	1	0	6	MM 454	Corrosion and Protection of Materials	2	1	0	6
MM 453	Engineering Polymers and Composites	2	1	0	6	MM 302	Mechanical Working of Metals	2	1	0	6
MM 304	Iron and Steel Making	2	1	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg	3	0	0	3
						113 200	Environmental Studies	3	0	0	3
						MM 656	Simulation and Optimization	3	0	0	6
	Institute Elective I	2	1	0	6		Institute Elective II	2	1	0	6
						MM 426	Equipment and Processes Design Lab.	0	2	2	6
MM 419	Computation and Controls Lab.	0	1	3	5	MM 462	Corrosion and Protection Lab.	0	0	1.5	1.5
MM 433	Manufacturing Proc. Seminar	0	0	3	3	MM 448	Thin Films Lab.	0	0	1.5	1.5
MM 388	Practical Training		PP	/NP							
Total Cred	dits	8	5	3	32	Total Cred	its	9	6	5	39
COURSES	FOR HONORS REQUIREMENT Elective	from th	e autur	nn sem	n. List			1	1		
	Honours 5				6						

Dual Degree : Specialization: Metallurgical Process Engineering (Contd.)

	COURSE CURRI	CULU	M FOI	R THE	NEW P	ROGRAMME (I	Dual Degree.) w.e.f. 2007 BATCH				
	Semester IX						Semester – X				
Course code	Course Name	(Credit	Struct	ure	Course	Course Name		Credi	t Struc	ture
						Code					
		L	T	P	C			L	T	P	C
MM 452	Plant Engineering	3	0	0	6		DD Elective II	3	0	0	6
	DD Elective I	3	0	0	6	MM 594	DDP Stage II				42
MM 593	DDP Stage I				30						
Total Credits			42			Total Cred	its		4	8	

LIST OF DD ELECTIVES

	Autumn Semester (July-December)						Spring Semester (January-June	e)					
Course code	Course Name	(Credit	Struct	ure	Course Code	Course Name		Credi	t Struc	ture		
		L	T	P	С			L	T	P	C		
MM 655	Modeling and Analysis	3	0	0	6	MM 622	Advanced Concepts in Iron Making	2	0	0	4		
MM 657	Design and Application of Engg. Materials	3	0	0	6	MM 624	Advanced Concepts in Steel Making	2	0	0	4		
MM 669	Mechanical Behaviour of Thin Films	3	0	0	6	MM 626	Thermomechanical Processing and Forming of Steel	3	0	0	6		
MM 677	Diffusion and Kinetics	3	0	0	6	MM 630	Mineral Process Engineering	3	0	0	6		
MM 680	Welding Science and Technology	3	0	0	6	MM 632	Surface Engineering	3	0	0	6		
MM 681	Plastic Deformation and Microstructure Evolution					MM 656	Simulation and Optimization	3	0	0	6		
MM 685	Electrical and Magnetic Materials	3	0	0	6	MM 638	Polymer Blends and Composites	3	0	0	6		
MM 687	Surface Science and Engineering					MM 652	Advanced Ceramics	3	0	0	6		
MM 691	Topics in Phase Transformation	3	0	0	6	MM 654	Advanced Composites	3	0	0	6		
EE 665	IC Technology	3	0	0	6	MM 658	Fracture Mechanics and Failure Analysis	3	0	0	6		
ME 613	Finite Element Methods	3	0	0	6	MM 668	Computational Methods for Metal Forming Analysis	3	0	0	6		
						MM 670	Powders and Sintered Products	3	0	0	6		
						MM 672	Solidification Processing	3	0	0	6		
						MM 674	Materials & Processes for Semiconductor Devices	3	0	0	6		
						MM 676	Superconductivity Materials & Applications	3	0	0	6		
						MM 678	Magnetism and Magnetic Materials	3	0	0	6		
						MM 682	Grain Boundaries and Interfaces	3	0	0	6		
						MM 684	X-Ray Diff. and Elec. Microscopy	3	0	0	6		
						MM 688	Non-Crystalline Materials	3	0	0	6		
						CE 620	Finite Element Method	3	0	0	6		
						CH 602	Characterisation of Polymers	3	0	0	6		

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE For 2007 batch on B.Tech./ DD (To accommodate HSS courses in V Semester)

	COURSE C	URRIC	CULUI	M FOR	R THE N	IEW PROGRA	AMME w.e.f. 2007 BATCH				
	Semester III						Semester – IV				
Course	Course Name	C	redit S	Structu	ıre	Course	Course Name		ire		
code				_	I ~	Code					- ~
		L	T	P	C			L	T	P	C
MM 201	Structure of Materials	2	1	0	6	MM 202	Thermodynamics of Materials	2	1	0	6
MM 203	Mechanics of Materials	2	1	0	6	ME 220	Theory of Machines and Machine	2	1	0	6
							Design				
						MM 305	Kinetics of Processes	2	1	0	6
EE 201	Intro. to Electrical Engg. & Electronics	3	1	0	8	PH 105	Modern Physics	3	1	0	8
MM 204	Transport Phenomena	2	1	0	6	EE 2XX	Electrical/ Electronics Lab.	0	0	3	3
IC 215	Exptn. and Meas. Lab	0	0.5	3	4	MM 212	Metallography and Structural	0	0.5	3	4
							Characterisation Lab.				
Total	<u> </u>	9	5	6	30	Total		8	4	3	33
						COURSES	FOR HONORS REQUIREMENT	•	•	•	
COURSES	FOR HONORS REQUIREMENT (Elective	from t	he autu	ımn lis	t)		•				
MM 409	Colloid and Interface Science	2	1	0	6	MM 206	Experimental Techniques in Materials	2	1	0	6
	(suggested)						Science (Core)				
COURSES	FOR MINOR REQUIREMENT					COURSES	FOR MINOR REQUIREMENT	1	1	1	
MM 202	Thermodynamics of Materials (Core)	2	1	0	6	MM 201	Structure of Materials (Core)	2	1	0	6

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE For 2007 batch on B. Tech. / DD (To accommodate HSS courses in V Semester)

	COURSE C	CURRI	ICULU	M FO	R THE	NEW PROG	RAMME w.e.f. 2007 BATCH					
	Semester V						Semester – VI					
Course code	Course Name	Credit Structure				Course Code	Course Name		Credit Structure			
		L	Т	P	C			L	T	P	C	
MM 301	Ceramics and Powder Metallurgy	2	1	0	6	MM 302	Electronic Properties of Materials.	2	1	0	6	
MM 303	Phase Transformations	2	1	0	6	MM 304	Metal Casting and Joining	2	1	0	6	
HS202 OR HS203 OR HS204 OR HS205	Introduction to Psychology	3 3 3 3	0 0 0	0 0 0 0	6 6 6	MM 306	Process Metallurgy Principles	2	1	0	6	
MM 307	Mechanical Behaviour of Materials	2	1	0	6	MA 214	Introduction to Numerical Analysis	3	1	0	8	
MM 311	Heat Treatment Lab.	0	1	3	5	MM 312	Casting and Joining Lab.	0	0	1.5	1.5	
MM 313	Mech. Testing Lab.	0	0.5	1.5	2.5	MM 314	Manufacturing Processes Lab.	0	0	1.5	1.5	
						MM 314s	Seminar (3 Credits)	0	0	3	3	
Total Cred	its				31.5	Total Credi	ts				32	
COURSES	FOR HONORS REQUIREMENT				I.	COURSES	FOR HONORS REQUIREMENT					
	Elective from the autumn sem. list						Elective from the spring sem. List or BTP I (6 credits)					
COURSES	FOR MINOR REQUIREMENT					COURSES	FOR MINOR REQUIREMENT					
MM 302	Electronic Properties of Materials (Core) Prerequisite: MM 201: Structure of Materials (Not available for EP, they can take any	2	1	0	6	MM 303	Phase Transformations (Core) Prerequisite: MM 202: Thermodynamics of Materials	2	1	0	6	