

Course Structure

R19

For AY2019-20 (B17) Batch

Metallurgical and Materials Engineering

For

BTech 4-Year Degree Course

(Applicable for the students admitted into E1 for the Academic Year 2019-20)

(I – IV Years Syllabus)



RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES

Basar, Nirmal, Telangana – 504107

Branch/Course: Metallurgical and Materials Engineering

Total Credits (4 Years): 155

I. INDUCTION PROGRAM

Induction Program (Mandatory)	3 Weeks Duration
Induction for students to be offered right at the start of the First-Year	<ul style="list-style-type: none">• Physical activities• Creative arts• Universal Human Values• Literacy• Proficiency Modules• Lectures by eminent people• Visits to local areas• Familiarization of Departments/Branches/Innovations

II. COURSE STRUCTURE

FIRST YEAR (E1) – SEMESTER – I

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MA1101	Linear Algebra and Calculus	BSC	3	1	0	4	4
2	EE1101	Basic Electrical Engineering	ESC	3	1	0	4	4
3	PH1104	Engineering Physics	BSC	3	1	0	4	4
4	CE1701	Engineering Graphics	ESC	0	0	6	6	3
5	HS1101	English	HSMC	2	0	0	2	2
6	PH1704	Engineering Physics Lab	BSCL	0	0	3	3	1.5
7	EE1701	Basic Electrical Engineering Lab	ESCL	0	0	2	2	1
8	HS1701	English Lab	HSMCL	0	0	2	2	1
Total				11	3	13	27	20.5

FIRST YEAR (E1) – SEMESTER – II

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MA1201	Differential Equations and Vector Calculus	BSC	3	1	0	4	4
2	CY1203	Engineering Chemistry	BSC	3	1	0	4	4
3	CS1201	Programming for Problem Solving	ESC	3	0	0	3	3
4	MM1201	Introduction to Materials Engineering	PCC	2	0	0	2	2
5	MM1202	Materials Workshop	ESC	2	0	2	4	3
6	HS1203	Communication Skills	HSMC	2	0	0	2	0
7	CY1803	Engineering Chemistry Lab	BSCL	0	0	3	3	1.5
8	CS1801	Programming for Problem Solving Lab	ESCL	0	0	4	4	2
Total				15	2	9	26	19.5

SECOND YEAR (E2) – SEMESTER – I

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MA2107	Probability and Laplace Transforms	BSC	3	1	0	4	4
2	BS2101	Environmental Science	MC	3	0	0	3	0
3	MM2101	Metallurgical Thermodynamics	PCC	3	0	0	3	3
4	MM2102	Non Metallic Materials	PCC	3	0	0	3	3
5	MM2103	Physical Metallurgy	PCC	3	0	0	3	3
6	MM2104	Mechanics of Solids	PCC	3	1	0	4	4
7	MM2703	Physical Metallurgy Lab	PCCL	0	0	2	2	1
Total				18	2	2	22	18

SECOND YEAR (E2) – SEMESTER – II

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	BM2213	Economics for Engineers	HSMC	3	0	0	3	3
2	MM2201	Phase Transformations	PCC	3	0	0	3	3
3	MM2202	Iron and Steel Making	PCC	3	1	0	4	4
4	MM2203	Mechanical Properties of Materials	PCC	3	0	0	3	3
5	MM2204	Physics of Materials	PCC	3	0	0	3	3
6	MM2205	Non Ferrous Extractive Metallurgy	PCC	3	0	0	3	3
7	MM2803	Mechanical Properties of Materials Lab	PCCL	0	0	2	2	1
8	MM2805	Extractive Metallurgy Lab	PCCL	0	0	2	2	1
Total				18	1	4	23	21

THIRD YEAR (E3) – SEMESTER – I

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MM3101	Heat Treatment	PCC	3	0	0	3	3
2	MM3102	Metal Casting and Welding	PCC	3	0	0	3	3
3	MM3103	Secondary Steel Making	PCC	3	0	0	3	3
4	MM3104	Transport Phenomena	PCC	3	0	0	3	3
5	MM3111	Program Elective Course	PEC-I	3	0	0	3	3
6	OE33XX	Open Elective Course	OEC-I	3	0	0	3	3
7	MM3701	Heat Treatment Lab	PCCL	0	0	2	2	1
8	MM3702	Metal Casting and Welding Lab	PCCL	0	0	2	2	1
Total				18	0	4	22	20

THIRD YEAR (E3) – SEMESTER – II

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	BM3212	Introduction to Industrial Management	HSMC	3	0	0	3	3
2	BM3205	Constitution of India	MC	2	0	0	2	0
3	MM3201	Materials Characterization	PCC	3	1	0	4	4
4	MM3202	Corrosion Engineering	PCC	3	0	0	3	3
5	MM3203	Instrumentation in Process Control for Materials Engineering	PCC	3	0	0	3	3
6	MM3204	Powder Metallurgy and Additive Manufacturing	PCC	3	0	0	3	3
7	OE34XX	Open Elective Course	OEC-II	3	0	0	3	3
8	MM3801	Materials Characterization Lab	PCCL	0	0	2	2	1
9	MM3802	Corrosion Engineering Lab	PCCL	0	0	2	2	1
10	MM3805	Materials Processing Lab	PCCL	0	0	2	2	1
11	MM3002	Technical Seminar-I	SIP	0	0	2	2	1
Total				20	1	8	29	23

FOURTH YEAR (E4) – SEMESTER – I

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MM4121	Program Elective Course	PEC-II	2	0	2	4	3
2	HS4101	Essence of Indian Traditional Knowledge	HSMC	2	0	0	2	0
3	MM4131	Problem Solving in Materials Engineering	PEC-III	3	0	0	3	3
4	OE43XX	Open Elective Course	OEC-III	3	0	0	3	3
5	OE43XX	Open Elective Course	OEC-IV	3	0	0	3	3
6	MM4001	Technical Seminar-II	SIP	0	0	2	2	1
7	MM4900	Summer Internship	SIP	0	0	4	4	2
8	MM4901	Project-I	SIP	0	0	8	8	4
Total				13	0	16	29	19

FOURTH YEAR (E4) – SEMESTER – II

Sl. No.	Course Code	Course Title	Course Category	Hours per Week			Total Contact Hours	Credits
				L	T	P		
1	MM424X	Program Elective Course	PEC-IV	3	0	0	3	3
2	MM425X	Program Elective Course	PEC-V	3	0	0	3	3
3	MM4902	Project-II	SIP	0	0	12	12	6
4	MM4000	Comprehensive Viva	SIP	0	0	4	4	2
Total				6	0	16	22	14

Course Structure of Credits

S.No	Course Category	Course Type	Standard Credits	MME Credits
1	BSC	Basic Science Course	20	23
2	ESC	Engineering Science Course	18	16
3	HSMC	Humanities and Social Sciences including Management Course	12	9
4	PCC	Program Core Course	71	64
5	PEC	Program Elective Course	15	15
6	OEC	Open Elective Course	12	12
7	MC	Mandatory Course	0	0
8	SIP	Seminar + Internship + Project Work + Comprehensive Viva	12	16
Total			160	155

Program Elective Courses

Sl. No.	Course Code	Course Title	Course Category
1	MM3111	Instrumental Methods of Analysis	PEC-I
2	MM3112	Mechanical Working of Metals	PEC-I
3	MM4121	Computational Materials Engineering	PEC-II
4	MM4122	Nuclear Engineering	PEC-II
5	MM4131	Problem Solving in Materials Engineering	PEC-III
6	MM4132	Surface Engineering	PEC-III
7	MM4241	Light Metals and Alloys	PEC-IV
8	MM4242	Composite Materials	PEC-IV
9	MM4243	Phase Diagrams	PEC-IV
10	MM4251	Advanced Materials Processing	PEC-V
11	MM4252	Polymer Engineering	PEC-V

Open Elective Courses

Sl. No.	Course Code	Course Title	Course Category
1	MM3301	Nano Materials	OEC-I
2	MM3302	Biomaterials	OEC-I
3	MM3401	Non Destructive Testing of Materials	OEC-II
4	MM3402	Functional Materials	OEC-II
5	MM4301	Advanced Ceramics and Composites	OEC-III
6	MM4304	Thermo-mechanical processing of Materials	OEC-III
7	MM4302	Electronic Materials	OEC-IV
8	MM4303	Energy Materials	OEC-IV

**Category-wise Break-up of Courses
R19, Metallurgical and Materials Engineering**

Humanities and Social Sciences including Management Courses

Sl. No.	Course Code	Course Title	Course Category	L	T	P	Total Contact Hours	Credits
1	HS1101	English	HSMC	2	0	0	2	2
2	HS1701	English Lab	HSMCL	0	0	2	2	1
3	HS1203	Communication Skills	HSMC	2	0	0	2	0
4	BM2213	Economics for Engineers	HSMC	3	0	0	3	3
5	BM3212	Introduction to Industrial Management	HSMC	3	0	0	3	3
6	BM3205	Constitution of India	MC	2	0	0	2	0
7	HS4101	Essence of Indian Traditional Knowledge	HSMC	2	0	0	2	0

**Category-wise Break-up of Courses
R19, Metallurgical and Materials Engineering**

Basic Sciences Courses

Sl. No.	Course Code	Course Title	Course Category	L	T	P	Total Contact Hours	Credits
1	MA1101	Linear Algebra and Calculus	BSC	3	1	0	4	4
2	PH1104	Engineering Physics	BSC	3	1	0	4	4
3	PH1704	Engineering Physics Lab	BSCL	0	0	3	3	1.5
4	MA1201	Differential Equations and Vector Calculus	BSC	3	1	0	4	4
5	CY1203	Engineering Chemistry	BSC	3	1	0	4	4
6	CY1803	Engineering Chemistry Lab	BSCL	0	0	3	3	1.5
7	MA2107	Probability and Laplace Transforms	BSC	3	1	0	4	4
8	BS2101	Environmental Science	MC	3	0	0	3	0

**Category-wise Break-up of Courses
R19, Metallurgical and Materials Engineering**

Engineering Science Courses

Sl. No.	Course Code	Course Title	Course Category	L	T	P	Total Contact Hours	Credits
1	EE1101	Basic Electrical Engineering	ESC	3	1	0	4	4
2	EE1701	Basic Electrical Engineering Lab	ESCL	0	0	2	2	1
3	CE1701	Engineering Graphics	ESC	0	0	6	6	3
4	CS1201	Programming for Problem Solving	ESC	3	0	0	3	3
5	CS1801	Programming for Problem Solving Lab	ESCL	0	0	4	4	2
6	MM1202	Materials Workshop	ESC	2	0	2	4	3