### DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING



## DRAFT COURSE STRUCTURE AND DETAILED SYLLABUS FOR THE M.TECH PROGRAM

IN

ADVANCED MATERIALS TECHNOLOGY

(BOARD OF STUDIES PROPOSED COPY)



### General, Course structure, Semester-wise credit distribution

### A. Total number of credits: 68

### B. Course code and definition, Abbreviations

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
PCC	Program Core Course
PEC	Program Elective Course
PLC	Program Laboratory Course
MLC	Mandatory Learning Course
OEC	Open Elective Course
AC	Audit Course
PROJ	Project

### E. Structure of the Program

S.No	Course Type	Credits
1	Program Core Course	15
2	Program Elective Course	12
3	Program Laboratory Course	3
4	Mandatory Learning Course	3
5	Open Elective Course	3
6	Audit Course	0
7	Project	32
	Total	68

### F. Semester-wise Credits Distribution

	TOTAL	E1-S1	E1-S2	E2-S1	E2-S2
Program Core Course	15	9	6	0	0
Program Elective Course	12	3	9	0	0
Program Laboratory Course	3	1.5	1.5	0	0
Mandatory Learning Course	3	2	1	0	0
Open Elective Course	3	3	0	0	0
Audit Course	0	0	0	0	0
Project	32	0	0	16	16
	68	18.5	17.5	16	16

**Total number of Audit Courses (AC): 02** 

### **Notations:**

E1-S1: Engineering first year first semester

E1-S2: Engineering first year second semester

E2-S1: Engineering second year first semester

E2-S2: Engineering second year second semester

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G. Structure of curriculum

### I Year I Semester

S. No	Course Code	Course Category	Course Title	L	Т	P	Credits
1	21AM1101	PCC	Symmetry and Properties of Materials	3	1	0	3
2	21AM1102	PCC	Phase Diagrams and Phase Transformations	3	1	0	3
3	21AM1103	PCC	Advanced Materials Characterization	3	1	0	3
4	21AM11XX	PEC	Program Elective Course-1	3	1	0	3
5	21AM11XX	OEC	Open Elective Course	3	0	0	3
6	21AM1171	MC	Research Methodology and IPR	2	0	0	2
7	21AM11XX	AC	Audit Course - 1	2	0	0	0
8	21AM1181	PLC	Advanced Materials Characterization Laboratory	0	0	3	1.5
	Total				4	3	18.5

### I Year II Semester

S. No	Course Code	Course Category	Course Title	L	Т	P	Credits
1	21AM1201	PCC	Processing and Design of Materials	3	1	0	3
2	21AM1202	PEC	Advanced Engineering Materials	3	1	0	3
3	21AM12XX	PEC	Program Elective Course-2	3	1	0	3
4	21AM12XX	PEC	Program Elective Course-3	3	1	0	3
5	21AM12XX	PEC	Program Elective Course-4	3	1	0	3
6	21AM1271	MLC	Seminar	1	0	0	1
7	21AM12XX	AC	Audit Course – 2	2	0	0	0
8	21AM1281	PLC	Phase Transformations Laboratory	0	0	3	1.5
Total	·			18	5	3	17.5

### **II Year I Semester**

S. No	Course Code	Course Category	Course Title	Credits
1	21AM2181	PROJ	Project Work (Phase-1)	16

### II Year II Semester

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S. No	Course Code	Course Category	Course Title	Credits
1	21AM2281	PROJ	Project Work (Phase-2)	16

### **List of Program Elective Courses**

Course Category	Course Code	Course Title	Credits
PEC	21AMXX11	Science and Technology of polymer, ceramics and semiconductors	3
PEC	21AMXX12	Solar Photovoltaic: Principles, technologies and Materials	3
PEC	21AMXX13	Energy storage materials	3
PEC	21AMXX14	Nano materials	3
PEC	21AMXX15	Carbon Materials and Manufacturing	3
PEC	21AMXX16	Structural Analysis of Nano materials	3
PEC	21AMXX17	Optic electronic materials and devices	3
PEC	21AMXX18	VLSI fabrication	3
PEC	21AMXX19	Advanced Casting, Forming and Joining Processes	3
PEC	21AMXX20	Additive Manufacturing	
PEC	21AMXX21	Thermo Mechanical and Thermo chemical Process	3
PEC	21AMXX22	Advanced Solidification Process	3
PEC	21AMXX23	Crystal Elasticity and Crystal Plasticity	3
PEC	21AMXX24	Fracture Mechanics	3
PEC	21AMXX25	Creep and Fatigue Behavior of Materials	3
PEC	21AMXX26	Texture in Materials	3
PEC	21AMXX27	Computational Materials Engineering	3

Apart from the above listed subjects, any NPTEL/SWAYAM Course in related to Advanced Materials Technology can be offered as Program Elective Course.

### **List of Open Elective Courses**



Course Category	Course Code	Course Title	Credits
OEC	21AM1161	Business Analytics	3
OEC	21AM1162	Industrial Safety	3
OEC	21AM1163	Operations Research	3
OEC	21AM1164	Cost Management of Engineering Projects	3
OEC	21AM1165	Composite Materials	3
OEC	21AM1166	Waste to Energy	3

### **List of Audit Courses**

Course Category	Course Code	Course Title	Credits
AC	21AMXX72	English for Research Paper Writing	0
AC	21AMXX73	Disaster Management	0
AC	21AMXX74	Sanskrit for Technical Knowledge	0
AC	21AMXX75	Value Education	0
AC	21AMXX76	Constitution of India	0
AC	21AMXX77	Pedagogy Studies	0
AC	21AMXX78	Stress Management by Yoga	0
AC	21AMXX79	Personality Development through Life Enlightenment Skills.	0