M.TECH PROGRAMME
IN MATERIALS, MANUFACTURING AND MODELING

1. Name of the Program : M. Tech. in MATERIALS, MANUFACTURING AND MODELING

***2. Intake per year** : 25 candidates*

3. Eligibility Criteria and Selection Procedure :
Candidates seeking admission to this program must have B. Tech / B.E. or equivalent in Metallurgical / Mechanical / Production Engineering with FIRST class (60%) (55% for SC / ST). The candidates must have either a valid GATE score or 2 years relevant professional experience.
Selection will be based on the performance in a written test and / or interview.

4. Program Structure :

The program structure, summarized in the following table, comprises 5 core courses, 2 core laboratory courses and 4 elective courses in topics relevant to the program. In addition to above, an institute elective course, a course on Communications Skills, a seminar and two stage M. Tech. Dissertation are part of the program. The proposed structure is in compliance with the senate approved recommendations for M. Tech. programs of this institute.

Course / Credits	Sem I	Sem II	Sem III	Sem IV	Total
Core Courses	32	-	-	-	32
Elective (**)	-	24	-	-	24
Ins. Elective	-	6	-	-	6
Lab. Course	4		-	-	4
Seminar	4	-	-	-	4
R&D Project	-	-	-	-	-
Communication skills	4/0	0/4	-	-	+4
Training	-	-	-	-	-
Course Total	40 + 4/0	30+0/4	-	-	70+4
Project	-		50	40	90
Total	40+4/0	30+0/4	50	40	160+4

In view of the requirements for this special program, all the residential course requirements (courses, laboratories, seminar) have been scheduled in the first year. This enables a student of this program to work on her/his dissertation either at IIT Bombay or at the industry. Few other related issues are given below.

1. Elective Courses : The electives need to be taken from the list of electives approved by the senate.
2. One among the 5 elective courses may be replaced by a 6-credit R &D project subject to approval by faculty advisor and R & D project supervisor
3. Crediting of Under Graduate Courses : At most one per semester; maximum of 2 courses in the whole program.
4. Auditing of courses : At most one course per semester with consent of instructor.

5. Administration of the Program :

The M. Tech. Programme is inter-departmental in nature and is the first of its kind in the institute. The departments of Metallurgical Engineering and Material Science (MEMS), Mechanical Engineering (ME) and Mathematics would be primarily responsible for administering it but participation from other departments is not excluded. The program is coordinated by an Institute Program Committee(IPC) comprising of the Heads and representatives of the three departments. The Convenor of the IPC will be the Head of one of these departments and will change once every three years by rotation.

6. Financial Model :

The M. Tech. Programme is visualized to be the trend setter for offering customized programmes on request from leading industrial organizations to cater to their specialized needs for human resource generation for research and development activities. While the benefits of these programmes to IIT Bombay, the sponsoring organization(s) and the nation are undisputed, these must be backed up by a well defined financial model for their administration, sustenance and survival. The following model is being followed :

1. First component : Statutory Tuition Fees per candidate per semester which would include tuition and other fees for the academic programme. Non-statutory fees which include hostel, Gymkhana and other fees have to be paid by the candidate every semester as per institute rules.

2. Second component: Programme Administration fees to be paid annually by the sponsoring organization to take care of all operating expenses. This fee is expected to be constant and may be revised only when the intake changes significantly.

7. Semester Wise Breakup of Courses for the Proposed M. Tech. Program

First Semester

Core Courses	L	T	P	C
MM 621	3	0	0	6
MM 653	3	0	0	6
ME 649/659*	3	0	0	6
ME 663and /or ME601*	3	0	0	6
SI 507	3	0	2	8
MM 611 Lab course	0	0.5	3	4
HS 699 Communication Skills (PP/NP)	2	0	0	4

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* Any two of the 4 courses ME649/659/ k,36+4
663/601 with the restriction that only one of the ME649/ME659 could be taken

Second Semester

Elective Courses	L	T	P	C
Elective I (MM)	3	0	0	6
Elective II (ME)	3	0	0	6
Elective III (MT)	3	0	0	6
Elective IV (MM/ME/SI)	3	0	0	6
Elective V (Inst. Elective)	3	0	0	6
ZZ 694 Seminar	0	0	4	4

34

Third Semester

ZZ 697 Project I Stage 50

Fourth Semester

ZZ 698 Project II Stage 40

Total Credits : 160 + 4

NOTE : The symbols ZZ are placeholders and would be replaced by appropriate department labels subsequently.

Features: 1. All core courses in the first semester (2+2+1) + Communication skills

3. **Second semester- 4 electives from the three departments (minimum 1 from each list) seminar and 1 Institute elective (From the list of approved institute electives)**

8. Detailed curriculum:

A. Courses offered by Metallurgical Engg. & Materials Science

a. Core courses

i. MM 621 : Advanced Physical and Mechanical Metallurgy
ii. MM 653: Characterization of Materials

b. Laboratory curse

i. MM 611: Processing and Characterization of Steel

c. Elective courses

i. MM 622 : Advanced Concepts in Iron Making
ii. MM 624: Advanced Concepts in Steel Making
iii. MM 626: Thermomechanical Processing and Forming of steel
iv. MM 658: Fracture Mechanics and Failure Analysis
v. MM 680: Welding Science and Technology
vi. MM 670: Powders and Sintered Products
vii. MM 632: Surface Engineering
viii. MM 677 : Diffusion and Kinetics
ix. MM 684 : X-Ray Diffraction and Electron Microscopy