

Integrated M Tech course (Major)

Multidisciplinary Minor (MDM)

Ability Enhancement Course (AEC)

Indian Knowledge System (IKS)

Co-curricular activities (CCA)

Vocational and Skill Enhancement (VSEC)

Open Elective (OE)

**NATIONAL
EDUCATION
POLICY
2020**



National Education Policy 2020

**Implementation of NEP
in**



**Institute of Chemical Technology Mumbai
Marathwada Campus, Jalna**



NEP Implementation

NEP Implementation Committee, ICT-MARJ

Sr. No.	Specialization	Name	Responsibility
1	Applied Mathematics	Dr. Sandeep P Bhairat	Campus Coordinator
2	Chemical Engineering	Dr. L P Ramteke	Member
3	Food Technology	Dr. R F Chavan	Member
4	Library Assistant	Mr. Ganesh Barbile	Member

NEP 2020 Saarthi: Students involvement, ICT-MARJ

Sr. No.	Department	Name	E-mail ID	Responsibility
1	Chemical Engineering (Major)	Mr. Mayur Marathe	imt23ms.marathe@stumarj.ictmumbai.edu.in	Class Representative (Int. M Tech 2023 Batch)
2	Chemical Engineering (Major)	Mr. Devanshu Kale	imt22dd.kale@stumarj.ictmumbai.edu.in	Technology Association Student Coordinator



NEP Implementation

Integrated Master of Technology (Int. M. Tech.)

Major: Chemical Engineering with

Multidisciplinary Minors

with effect from

Academic Year 2023 – 24



Key Features under NEP 2020

- Flexibility to move from one discipline of study to another - **Multi and/ or Interdisciplinary learning.**
- Choose the courses of interest in **ALL** disciplines.
- Flexibility to move from one institution to another
- Mandatory **One Semester Internship/ On Job Training (OJT).**
- Mandatory **Vocational and Skill Enhancement Courses (VSEC)**
- Mandatory **Indian Knowledge System (IKS)**
- Mandatory **Community Engagement Project (CEP)/ Field Project (FP)**
- **NSQF compliant Skill-based Courses**
- **Credits for Co-curricular and Extra-Curricular Activities**
- **Ability Enhancement Courses (AEC) (one Modern Indian Language - Marathi)**
- **Value Education Courses (VEC) in Emerging areas of Engineering/ Technology.**
- **Single and Double Minors, Honors, Research degree and Open Electives (OE)**
- **Multiple entry and exit options - internships for Exits**

Course Structure



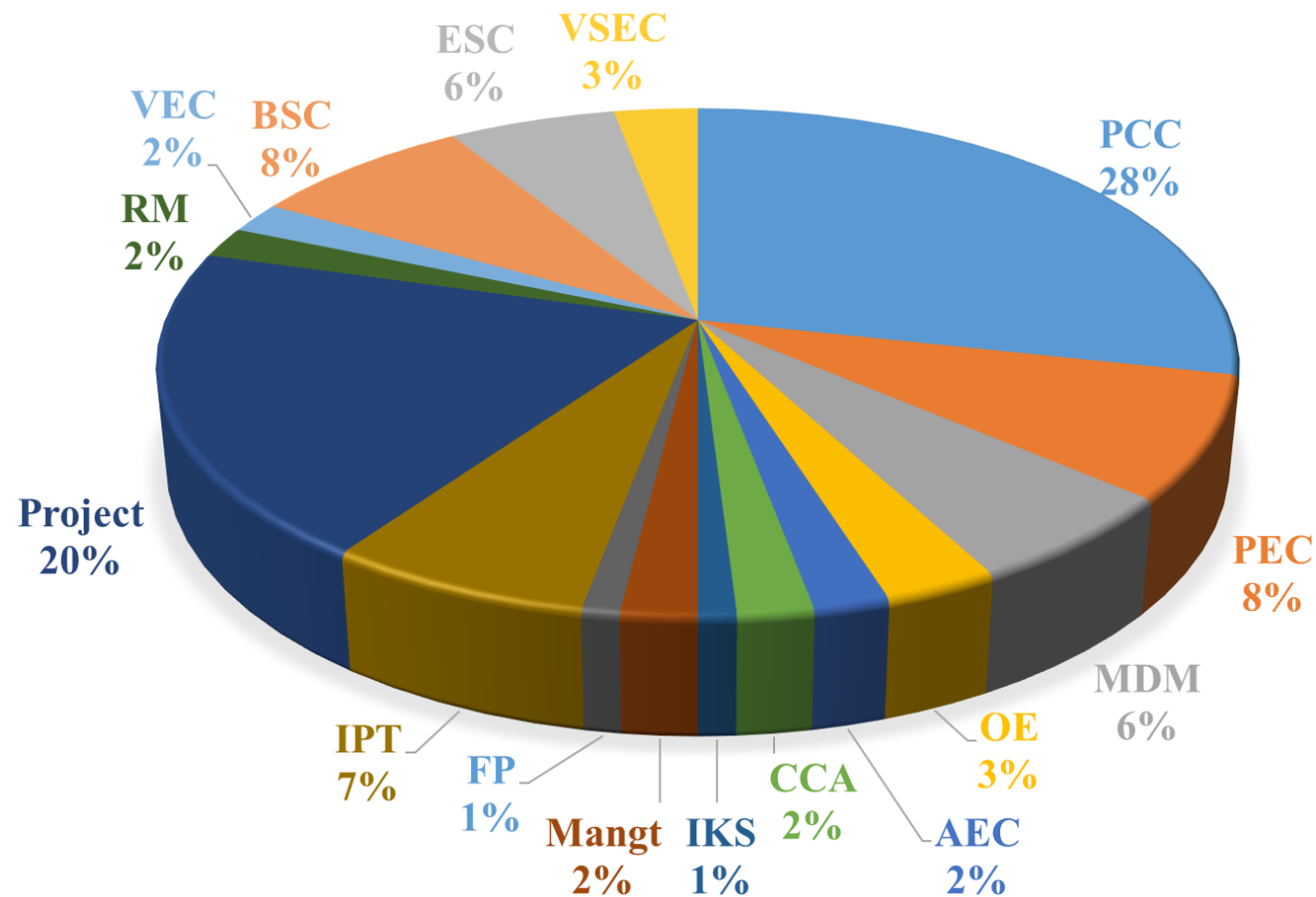
Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	8-10	6-8		--	--	--	--	--	14-18
Engineering Science Course		8-10	4-6		--	--	--	--	--	12-16
Programme Core Course	PCC	--	2	8-10	8-10	10-12	8-10	4-6	4-6	44-56
Programme Elective Course	PEC	--	--	--	--	4	8	2	6	20
Multidisciplinary Minor	MDM		-	2	2	4	2	2	2	14
Open Electives	OE	--	--	4	2	2	--	--	--	8
Vocational and Skill Enhancement Course	VSEC	2	2	--	2	--	2	--	--	8
Ability Enhancement Course	AEC	2	--	--	2	--	--	--	--	4
Humanities, Social Science, and Management Entrepreneurship/ Economics/ Management Courses	HSSM	--		2	2	--	--	--	--	4
Indian Knowledge System	IKS		2		--	--	--	--	--	2
Value Education Course	VEC	--	--	2	2	--	--	--	--	4
Research Methodology	RM	--	--	--	--	--	--		4	4
Community /Field Project	CEP / FP	--	--	2	--	--	--	-	-	2
Design Project	DP	--	--	--	--	--	--		4	4
Internship	OJT	--	---			--	--	12	-	12
Co-curricular Liberal Courses	CC	2	2		--	--	--	--	-	4
Total Credits (Major)		20-22	20-22	20-22	20-22	20-22	20-22	20-22	20-22	160-176

NEP Implementation

Distribution of Various Course types

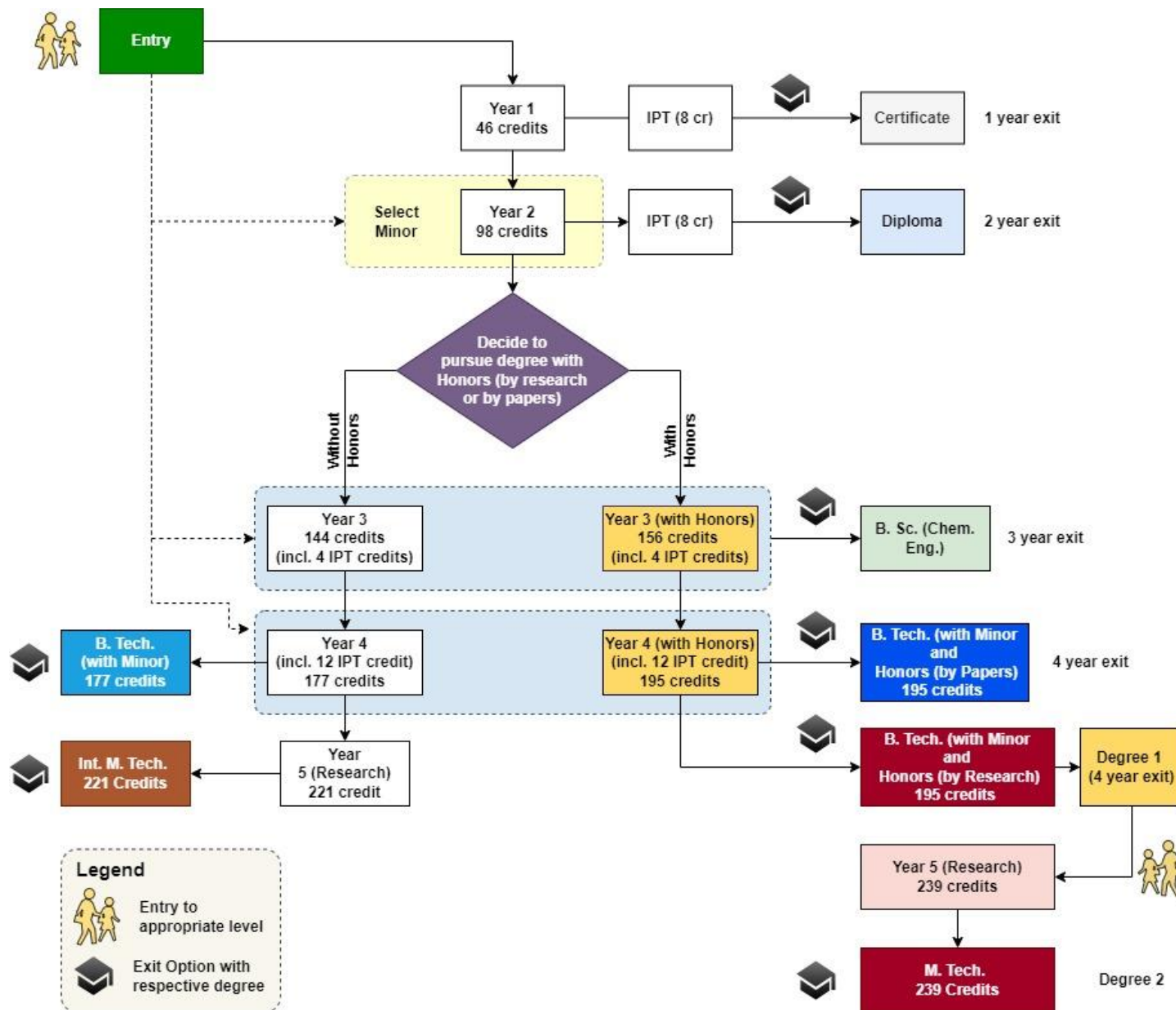
Basic Science Course	BSC
Engineering Science Course	ESC
Programme Core Course	PCC
Programme Elective Course	PEC
Multidisciplinary Minor	MDM
Open Electives	OE
Vocational and Skill Enhancement Course	VSEC
Ability Enhancement Course	AEC
Humanities, Social Science, and Management Entrepreneurship/ Economics/ Management Courses	Mangt.
Indian Knowledge System	IKS
Value Education Course	VEC
Research Methodology	RM
Community /Field Project	FP
Design Project	Project
Internship	IPT
Co-curricular Liberal Courses	CCA

DISTRIBUTION OF VARIOUS COURSE TYPES (IN PERCENTAGE) FOR THE PROGRAMME AS PER THE GUIDELINES OF NEP 2020



NEP Implementation

Programme Structure



Multidisciplinary Minor (MDM) Degree



MDM Courses

- Food Technology
- Pharmaceutical Chemistry & Technology
- Polymer and Materials Engineering
- Energy Technology
- Petroleum and Petrochemicals Technology
- Lipids Technology
- Materials Engineering & Technology
- Material Physics
- Chemistry

MDM Orientation Program



Major Degree Programme Structure



Sem I

Course Code`	Subjects	Course Type	Credits
CHT3151	Applied Chemistry	BSC	2
CHP3151	Applied Chemistry Lab	BSC	2
MAT3151	Mathematics-I	BSC	4
PHT3151	Applied Physics	BSC	2
PHP3151	Applied Physics Lab	BSC	2
EST3151	Structural Mechanics	ESC	2
ESP3151	Structural Mechanics Lab	ESC	2
ESP3152	Engineering Graphics with Computer Aided Modeling	VSEC	2
HUP3151	Communication Skills- English	AEC	2
HUP3152	OPEN Activity- Sports/ Fine arts/Yoga/ Music/NSS	CCA	2
Total			22

Sem II

Course Code	Subjects	Course Type	Credits
CHT3152	Applied Chemistry II	BSC	2
MAT3152	Mathematics – II	BSC	4
EST3153	Electrical Engg and Basic Electronics	ESC	2
ESP3153	Electrical Engg and Basic Electronics Lab	ESC	2
EST3152	Mechanical Engg	ESC	4
EST3154	Introduction to Chemical Engineering	ESC	2
CEP3151	Material Balance and Energy Balance Calculations	PCC	2
ESP3154	Engineering Applications of Digital computers	VSEC	2
HUT3153	MOOCs- Indian Knowledge System	IKS	2
HUP3154	OPEN Activity- Sports/ Fine arts/Yoga/ Music/NSS	CCA	2
Total			24

Sem III

Course Code`	Subjects	Course Type	Credits
CET3257	Fluid Flow	PCC	2
CET3252	Heat Transfer	PCC	2
EST3155	Engineering Thermodynamics	PCC	2
CET3253	Industrial Chemistry and Reaction Engineering	PCC	4
CEP3251	Chemical Engineering Lab-I	PCC	2
XXT	MDM- I: From sciences and/or any other Engineering Discipline	MDM	2
CHTxxxx	From Basic Sciences (Chemistry)	OE	2
CHPxxxx	From Basic Sciences (Chemistry)	OE	2
XXT	From Basic Sciences (Physics/ Biology)	OE	2
HUP3155	Modern Indian Language-Marathi (Any other language will be using MOOCs)	AEC	2
HUT3156	Basic Principles of Finance & Economics	Management	2
CET3257	Environmental Sciences	VEC	2
Total			26

Major Degree Programme Structure



Sem IV

Course Code`	Subjects	Course Type	Credits
CET3254	Chem Engg Operations	PCC	4
CET3258	Process Safety	PCC	2
CET3256	Instrumentation and Process Dynamics	PCC	2
XXT	MDM –II: From sciences and/or any other Engineering Discipline	MDM	2
XXP	From sciences and/or any other Engineering Discipline	MDM	2
XXT	From Basic Sciences (Chemistry/ Physics/Biology / Maths/ material Science)	OE	2
CEP3252	Chemical Engg Lab-II	PCC	2
HUT3157	Industrial Management	Management	2
ESP3157	Digital Computation in Emerging areas	VEC	2
	Community Projects	FP	2
CETxxx	Chemical Engg Elective – I	PEC	4
Total			26

Sem V

Course Code`	Subjects	Course Type	Credits
CET335	Chemical Reaction Engineering	PCC	2
CET3352	Momentum Transfer	PCC	2
CET3353	Chemical Engg Thermodynamics	PCC	4
CEP3253	Chemical Engineering Lab - III	PCC	2
CEP3255	Process Simulation Lab - I	VSEC	2
CETxxx	Chemical Engg Elective-II	PEC	4
CETxxx	Chemical Engg Elective-III	PEC	4
XXT	MDM-IV: From sciences and/or any other Engineering Discipline	MDM	2
XXP	MDM- From sciences and/or any other Engineering Discipline	MDM	2
CET3361	Honors Course -1	PCC	4
Total			28

Sem VI

Course Code	Subjects	Course Type	Credits
CET3362	Honors Course 2	PCC	4
CET3354	Chemical Process Control	PCC	2
CET3356	Separation Processes + Membrane	PCC	2
CET3357	Heat Transfer Equipment design	PCC	2
CETxxx	Chemical Engg Elective-IV	PEC	4
CET3363	Honours Course-3	PCC	4
XXT	MDM- V: From Sciences and/or any other Engineering Discipline	MDM	2
CEP3256	Process Simulation Lab-II	VSEC	2
CEP3254	Chemical Engineering Lab-IV	PCC	2
CET3358	Chemical Project Economics	PCC	2
CEP3373	IPT (after Semester VI exams for eight weeks)	IPT	4
Total			30

Major Degree Programme Structure



Sem VII

Course Code`	Subjects	Course Type	Credits
CET3451	Chemical Process Development and Engineering	PCC	3
CET3452	Chemical Industrial Management	PCC	2
CETxxx	Chemical Engg Elective III-Environmental Engineering and Chemical Process Safety	PEC	4
CEP3451	Chemical Process Equipment Design and drawing	PCC	2
CET3364	Honours Course-4/Research-4	PCC	2
CET3365	Honours Course-5/Research-5	PCC	4
XXT	MDM-VI: From sciences and/or any other Engineering Discipline	MDM	2
CEP3452	Literature Review (Research Methodology – I)	RM	2
CEP3453	Design and Analysis of Experiments (Research Methodology – II)	RM	2
CEP3461	Design Project - I	Project	4
	Total		27

Sem VIII

Course Code`	Subjects	Course Type	Credits
CEP3474	IPT (4-6 months)	IPT	12
	Total		12

Sem XI

Course Code`	Subjects	Course Type	Credits
CET3555	Advanced Transport Phenomena	PCC	3
CET3552	Advanced Separation Processes	PCC	3
CET3553	Advanced Reaction Engineering	PCC	3
CET3554	Advanced Mass transfer	PCC	3
CEP3563	Thesis	Research	10
	Total		22

Sem X

Course Code`	Subjects	Course Type	Credits
CEP3564	Thesis	Research	22
	Total		22

NEP Implementation

Co-curricular activities

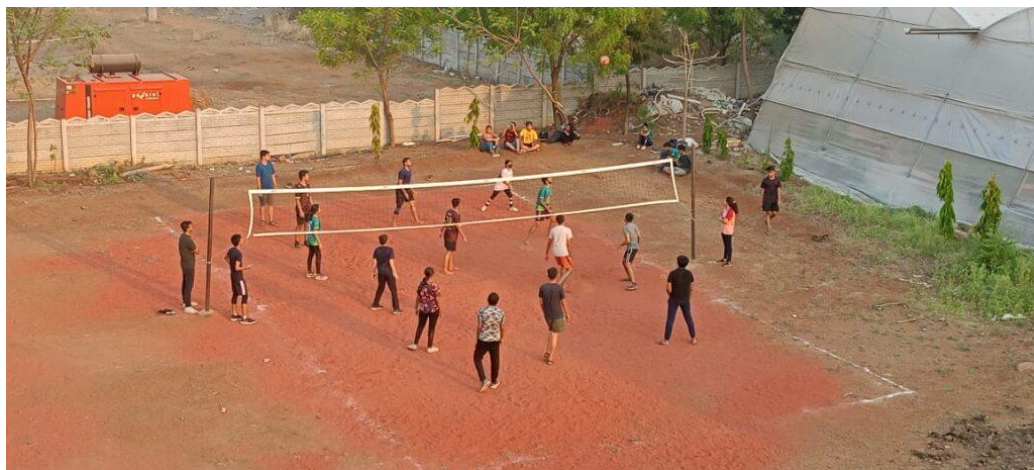
Volleyball



Volleyball



Sports (Sem II)



Volleyball

Kabbadi

Open Electives



Department	SEM - III	SEM - IV
Physics	Engineering Physics	Introduction to Materials Physics
Chemistry	Analytical Chemistry, Analytical Chemistry Laboratory	Advanced Analytical Chemistry
Biology	Introduction to Biological Science	Fundamentals of Biochemistry & Microbiology
Mathematics	Mathematical Modelling	Differential Equations and Dynamical Systems



Honors Subjects

- Honors - I: Biochemical Engineering
- Honors - II: Multiphase Reaction Engineering
- Honors - III: Mathematical Methods & Optimization in Chemical Engineering
- Honors - IV: Refinery Science and Engineering
- Honors - V: Catalytic Science and Engineering
- Honors: VI: Statistical Thermodynamics

AEC Courses (SEM III)

- Marathi Bhasha – Kaushalya Vikas
- NPTEL, MOOC courses as per availability

IKS (SEM II)

- IKS – An Introduction to Ancient Indian Mathematics
- IKS – Traditional Indian Chemical Technology
- Comprehensive list of IKS courses offered by various institutes, MOOCs, NPTEL have been created and made available to the students



Program Elective Course (PEC)

- Process Intensification
- Chemical Safety and Risk Management
- Environmental Engineering and Chemical Process Safety
- Perspectives of Society, Science and Technology
- Machine Learning
- CFD applications in chemical processes
- Project Management: Case Study Approach
- Plant Utilities
- Downstream Processing in Biochemical Industry
- Enhanced Oil Recovery
- Molecular Quantum Mechanics
- Green Chemistry & Catalysis
- Engineering Aspects of Manufacturers of Organic Chemicals
- Statistical Methods in Engineering

There are Five Program elective course which are offering for major course. PEC courses are being started from Sem IV (one elective), Sem V (Two Electives), Sem VI (One elective) and Sem VII (One elective). Those course will be selected from 46 PEC courses given in the major syllabus.