

Implementation of NEP 2020

National Education Policy 2020

Implementation

NEP Implementation Team



Institute of Chemical Technology, Mumbai

Deemed to be University

Government of Maharashtra

Preparation for NEP Implementation A Structured Approach



NEP 2020
Advisory Committee

NEP Implementation
Team

ICT Bhubaneshwar Campus

ICT Mumbai Campus

ICT Jalna Campus

Campus Coordinator
MDM Coordinators
CCA Coordinator

Department Coordinators
MDM Coordinators
CCA Coordinator
AEC Coordinator
NEP SAARTHI (UGC Guidelines)

Campus NEP Coordinator
MDM Coordinators
CCA Coordinator



Sr. No.	Department	Member	Email
1	Chemical Engineering	Professor V. G. Gaikar	vg.gaikar@ictmumbai.edu.in
2	Chemical Engineering	Professor A. W. Patwardhan	aw.patwardhan@ictmumbai.edu.in
3	Pharmaceutical Sciences and Technology	Professor S. V. Joshi	sv.joshi@ictmumbai.edu.in
4	Pharmaceutical Sciences and Technology	Professor P. S. Kharkar	ps.kharkar@ictmumbai.edu.in



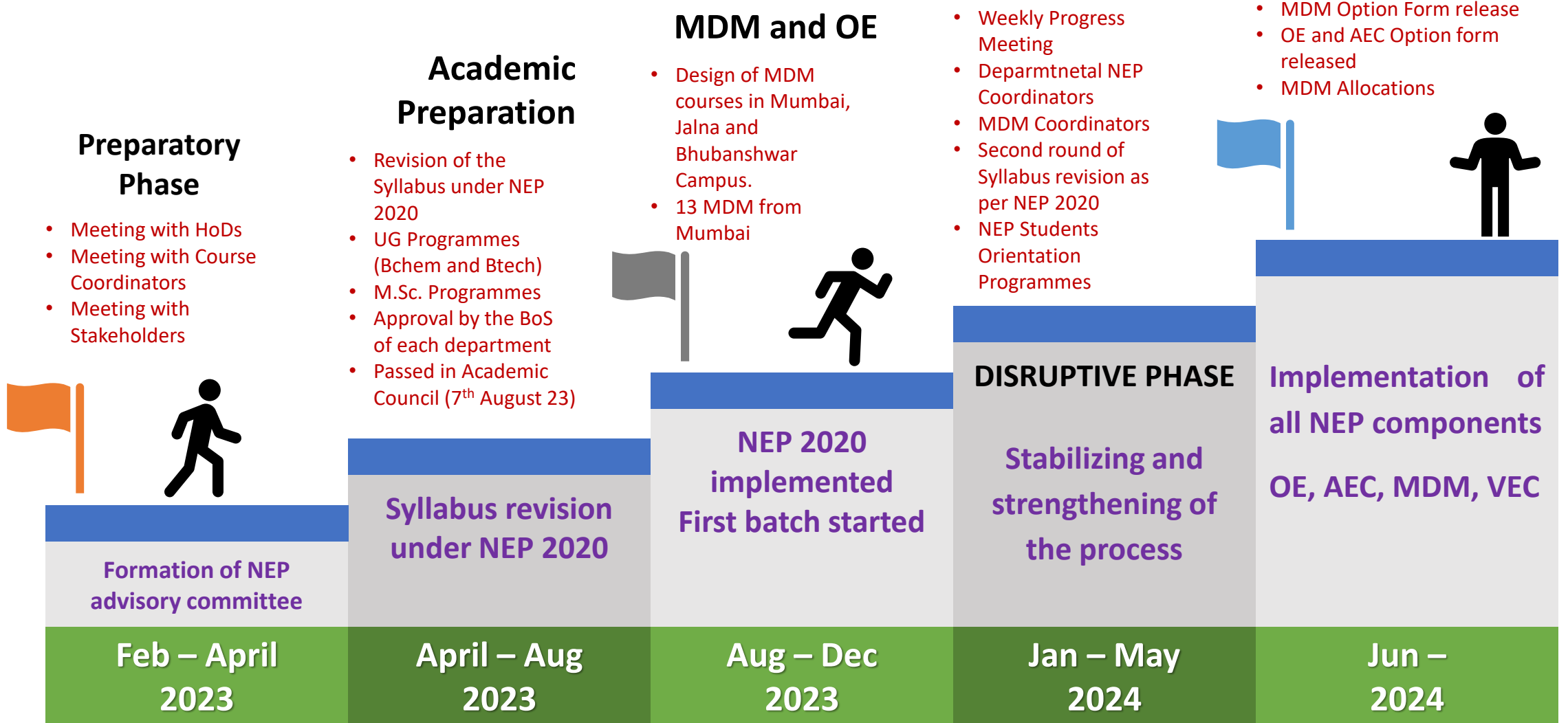
Sr. No.	Department	Member	Email	Responsibility
1	Mathematics	Dr. Amiya R. Bhowmick	ar.bhowmick@ictmumbai.edu.in	Chairman
2	Chemical Engineering	Dr. Channamallikarjun S. Mathpati	cs.mathpati@ictmumbai.edu.in	Secretary

Serial No.	Department	Coordinator	Email
1	Chemistry	Dr. Shraddha Tewari	ss.tiwari@ictmumbai.edu.in
2	Mathematics	Dr. Amiya Ranjan Bhowmick	ar.bhowmick@ictmumbai.ac.in
3	Biological Sciences and Biotechnology	Dr. Gunjan Prakash	g.prakash@ictmumbai.edu.in
4	Pharmaceutical Sciences and Technology	Dr. Nitin Arote	nd.arote@ictmumbai.edu.in
5	Fibres and Textile Processing Technology	Dr. Santosh Biranje	ss.biranj@ictmumbai.edu.in
6	Food Engineering and Technology	Dr. Jyoti Sagar Gokhale	js.gokhale@ictmumbai.edu.in
7	General Engineering	Dr. Sachin G Solanke	sg.solanke@ictmumbai.edu.in
8	Humanities and Management Sciences (Proposed)	Dr. Rama Iyar	ramaiyer2008@gmail.com
9	Physics	Dr. Paresh Salame	ph.salame@ictmumbai.edu.in
10	Polymer and Surface Engineering	Dr. Aarti More	ap.more@ictmumbai.edu.in
11	Speciality Chemicals Technology	Dr. G. Subramanyam	gv.subrahmanyam@ictmumbai.edu.in
12	Oils Oleochemicals and Surfactants Technology	Dr. Amit Pratap	ap.pratap@ictmumbai.edu.in
13	Chemical Engineering	Dr. C. S. Mathpati	cs.mathpati@ictmumbai.eud.in
14	ICT Jalna Campus	Dr. Sandeep Bhairat	sp.bhairat@marj.ictmumbai.edu.in
15	ICT Bhubaneswar Campus	Dr. Ayantika Sett	a.sett@iocb.ictmumbai.edu.in



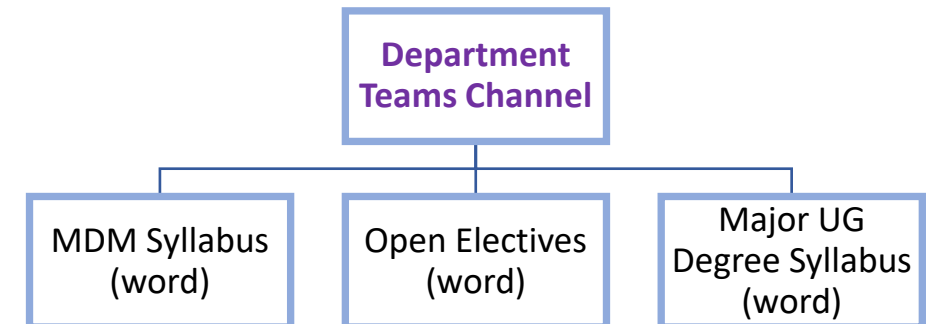
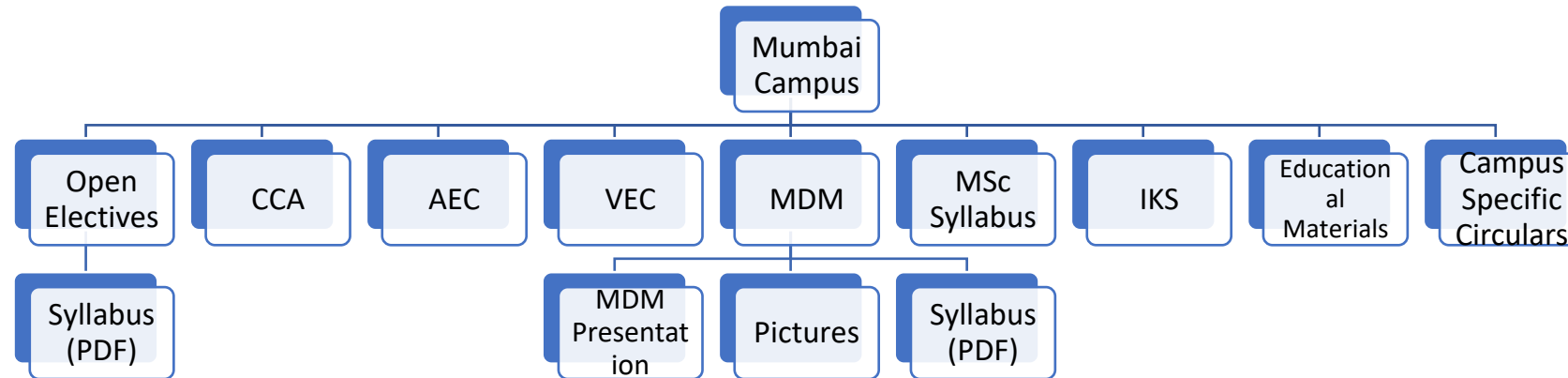
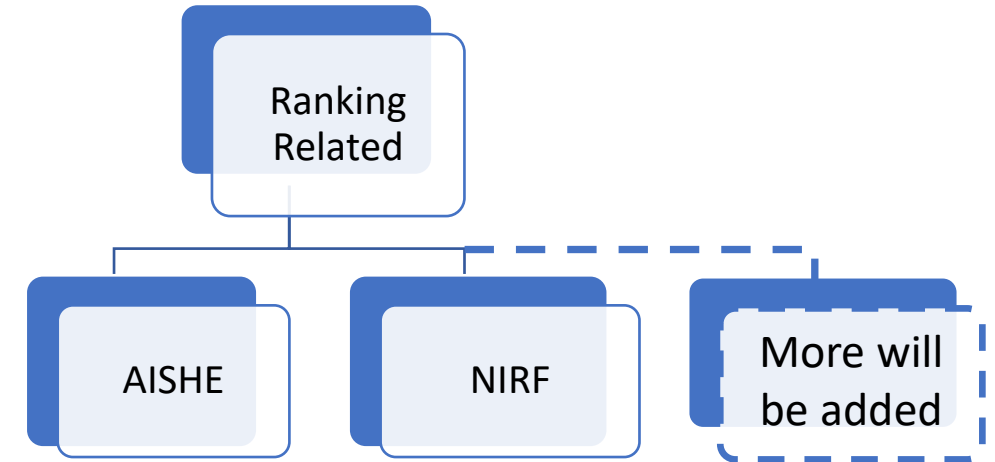
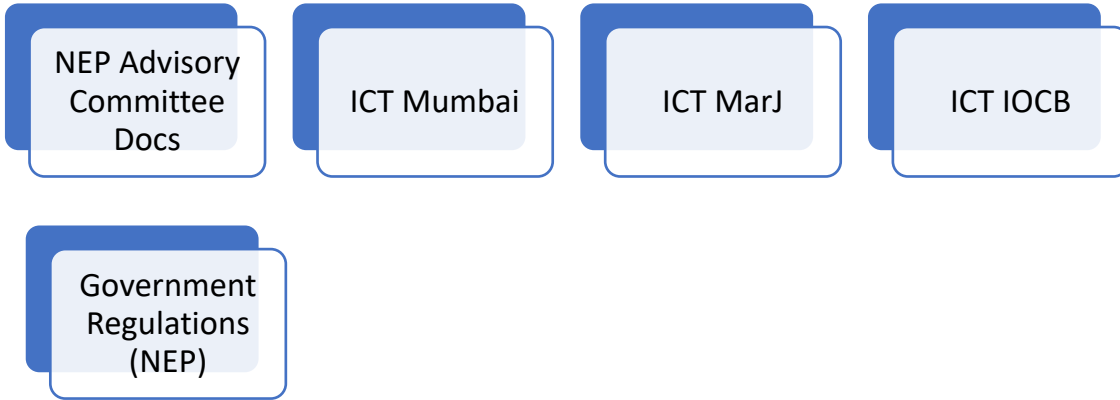
Sr. No.	Department	Name	Email	Responsibility
1	Chemical Engineering	Takshil Paresh Shah	23chetp.shah@ug.ictmumbai.edu.in	CR, Bachelor of Chemical Engineering
2	Pharmaceutical Sciences and Technology	Digvijay Dhairyashil Patil	23phtdd.patil@ug.ictmumbai.edu.in	CR, Bachelor of Technology
3	Speciality Chemicals Technology	Akash Bhupesh Borkar	sur21ab.borkar@pg.ictmumbai.edu.in	General Secretary, TA

Nominated by the Honourable Vice Chancellor as per the recommendation of the University Grant Commission





MAIN FOLDERS (IN GENERAL)







Four – Year UG Engineering Curriculum
in
First Phase
with effect from
Academic Year 2023 – 24

Four Year Multidisciplinary Engineering Curriculum Framework



- 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*)
- **Value Education** Courses (VEC) in Emerging areas of Engg/Technology.
- **Single and Double Minors, Research degree and Open Electives (OE)**
- **Multiple entry and exit options-** internships for Exits



- Formation of **NEP Implementation Committee at Institute Level**, under guidance of NEP Advisory Committee (Review Meetings are held every Thursday).
- Representation of All Departments, Section Heads and campuses in NEP Implementation Committee - Involvement of all stake-holders with responsibilities delegated.
- Consultative Meetings with Heads of Departments, Directors of campuses, Assistant Registrar of Academic Programs, Controller of Examination, IT department, and librarian for sensitization about requirement as per NEP guidelines.
- Sensitization of all faculty members for implementation of NEP guidelines by the HoD and departmental representatives on NEP Implementation Committee.
- Sensitization of FY Students for Multi-Disciplinary Minor (MDM) Degree Programmes - Several Orientation programs conducted for FY students at three campuses



1. Restructuring of credits framework of all undergraduate Academic Programs as per framework suggested by State Government directives (**Government of Maharashtra, GR, NEP-2022/(67/23)/2, Date July 4, 2023**).
2. Identification of Minor degree course: Each department offers one Minor Degree open to all other departments of the University (**Total 13, including basic sciences, and emerging areas such as AI & ML, Material Science and Management**)
3. Preparation of Syllabi of all Major and Minor Degree Programmes offered at all three campuses and made available at Institute's website *before* academic year began in 2023.
4. Identification of basic and useful skills required in candidates at the intermediate exit points, after Sem-II, Sem-IV and Sem-VI.
5. **IKS (Indian Technology), CCA (Sports, NSS, Yoga, Fine Arts), Open electives (OEs), VEC and VSEC** introduced in Sem-I-IV of all programmes.
6. **E-Samarth ERP** adopted for implementation of NEP guidelines.
7. Faculty Development program in new pedagogy are in progress across all campuses.
8. **Academic Credits Bank** - uploading of data in progress, credit transfer policy in place.



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



Levels	Qualification / Title	Credits		Semester	Year
		Minimum	Maximum		
4.5	One Year UG Certificate in Engg./ Tech. (exit after Sem-II)	40	44	2	1
5	Two Years UG Diploma in Engg./ Tech. (Exit after Sem-IV)	80	88	4	2
5.5	Three Years Bachelor's Degree in Vocation (B. Voc.) or B. Sc. (Engg./ Tech.) (Exit after S-VI)	120	132	6	3
6	4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg./ Tech. with a Multidisciplinary Minor degree	160	176	8	4
6	4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg./ Tech.- Honors with Multidisciplinary Minor degree	180	194	8	4
6	4 Years- Bachelor's Engg./ Tech. Honours with Research Degree in chosen Major Engg./ Tech. Discipline with Multidisciplinary Minor degree	180	194	8	4
6	4-Years Bachelor's degree (B.E./ B.Tech. or equivalent) in Engg./ Tech.- Major Engg. Discipline with Double Minors (Multidisciplinary and Specialization Minors)	180	194	8	4
7	5- Year Integrated MTech with Research Degree in Major Engg. Discipline with Multidisciplinary Minor degree	220	234	10	5

Major Degree Programme Structure Bachelor of Chemical Engineering



Course Code	Subjects	Course Type	Credits
CHT1251	Applied Chemistry	BSC	2
MAT1101	Applied Mathematics - I	BSC	4
GET1123	Structural Mechanics	ESC	3
GET1125	Electrical Engineering and Electronics	ESC	2
CHP1252	Applied Chemistry Laboratory	BSC	2
GEP1124	Structural Mechanics Laboratory	ESC	1
GEP1126	Electrical Engineering and Electronics Laboratory	ESC	2
GEP1127	Engineering Graphics and Computer Aided Drafting (CAD)	VSEC	2
HUP1110 A	Communication Skills	AEC	2
HUPXXXX	OPEN Activity - Sports/ Fine arts/Yoga/ Music/NSS**	CCA	2
Total			22

SEMESTER - I

Course Code	Subjects	Course Type	Credits
PYT1251	Applied Physics	BSC	2
MAT1102	Applied Mathematics - II	BSC	4
GET1128	Elements of Mechanical Engineering	ESC	4
CET1151	Introduction to Chemical Engineering	ESC	2
PYP1252	Applied Physics Laboratory	BSC	2
CEP1152	Material Balance and Energy Balance Calculations	PCC	2
CEP1153	Engineering Applications of Digital Computers	VSEC	2
HUTXXXY	MOOC- Indian Knowledge System (NPTEL/SWAYAM - Introduction to Ancient Indian Technology)	IKS	2
HUTXXXZ	OPEN Activity- Sports/ Fine Arts/Yoga/ Music/NSS**	CCA	2
Total			22

SEMESTER - II

SEMESTER - III

Course Code	Subjects	Course Type	Credits
CET1154	Fluid Flow	PCC	2
CET1155	Heat Transfer	PCC	2
CET1156	Engineering Thermodynamics	PCC	2
CET1157	Process Safety	PCC	2
HUT1252	Basic Principles of Finance & Economics	EEM	2
CET1159	Environmental Sciences	VEC	2
XXXXXXXX	MDM-I: From Sciences and/or any other Engineering / Humanities Discipline	MDM	2
CEP1158	Chemical Engineering Laboratory - I	PCC	2
XXXXXXXX	From Basic Sciences (Chemistry/ Physics/Biology / Maths / Humanities)	OE	4
HUPXXXX	Modern Indian Language (Marathi / Hindi or Any other language will be chosen)	AEC	2
Total			22

SEMESTER - IV

Course Code	Subjects	Course Type	Credits
CET1160	Chemical Engineering Operations	PCC	4
CET1161	Industrial Chemistry and Reaction Engineering	PCC	4
CET1162	Instrumentation and Process Dynamics	PCC	2
XXXXXXXX	MDM II: From Sciences and/or any other Engineering / Humanities Discipline	MDM	2
XXXXXXXX	From Basic Sciences (Chemistry/ Physics/ Biology / Maths) or Humanities	OE	2
HUT1253	Production Management	EEM	2
CEP1163	Chemical Engineering Laboratory - II	VSEC	2
XXXXXXXX	Course in Emerging Areas	VEC	2
XXXXXXXX	Community Engagement Projects#	CEP/FP	2
Total			22.5

Community Engagement Project

Students will undertake community projects, as individual or a group, related to study of societal technological activities through various organization such as Lions club, Teach India, Marathi Vidnyan Parishad, CSR projects outsourced by various industries, ISR activities administered through Technological Association approved by the Dean, Student Affairs.

Major Degree Programme Structure

Bachelor of Chemical Engineering



Course Code	Subjects	Course Type	Credits	Course Code	Subjects	Course Type	Credits
CET1165	Chemical Reaction Engineering	PCC	2	CET1171	Multiphase Reaction Engineering	PCC	3
CET1166	Momentum Transfer	PCC	2	CET1172	Chemical Process Control	PCC	2
CET1167	Chemical Engineering Thermodynamics	PCC	4	CET1173	Material Technology	PCC	2
XXXXXXX	Chemical Engineering Elective - I Offered by Dept / NPTEL / MOOCS	PEC	4	CET1174	Separation Processes	PCC	3
XXXXXXX	MDM III: From Sciences and/or any other Engineering / Humanities Discipline	MDM	4	CET1175	Heat Transfer Equipment Design	PCC	2
XXXXXXX	MOOCs- From Other Science Disciplines and Humanities	OE	2	XXXXXXX	Chemical Engineering Elective – II Offered by Dept / MOOCS	PEC	4
CEP1168	Chemical Engineering Laboratory - III	PCC	2	XXXXXXX	MDM IV: From Sciences and/or any other Engineering / Humanities Discipline	MDM	2
CEP1169	Process Simulation Laboratory - I	PCC	2	CET1176	Honours Course - II (Mathematical Methods and Optimization in Chemical Engineering)	PCC	4
CET1170	Honours Course – I (Biochemical Engineering)	PCC	4	CEP1177	Process Simulation Laboratory - II	VSEC	2
	Total		26	CEP1178	Chemical Engineering Laboratory - IV	VSEC	2
					Total		26

SEMESTER - V

SEMESTER - VI

Semester – VIII theory courses will be completed within 10 weeks and 12 – 16 weeks students will be in On Job Training. Appropriate arrangements will be made.

SEMESTER - VII

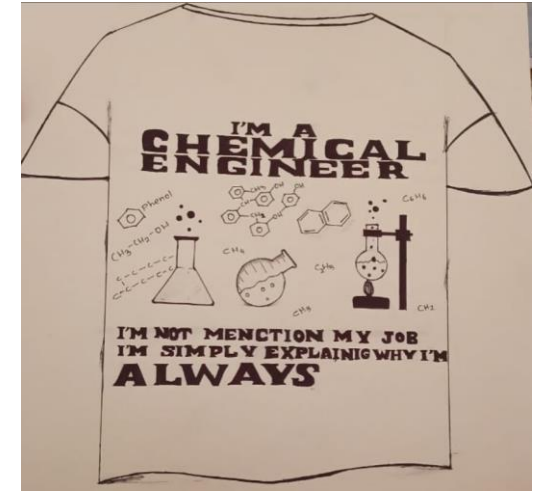
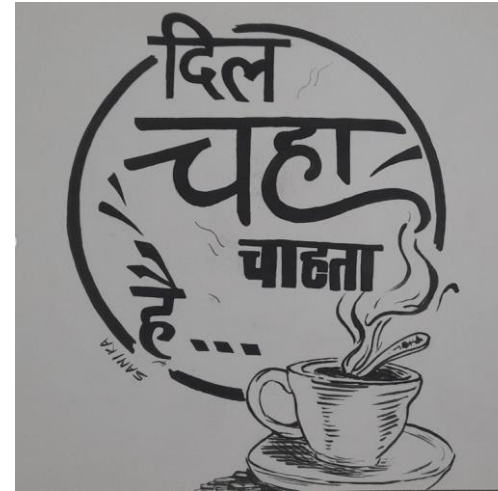
Course Code	Subjects	Course Type	Credits
CET1179	Chemical Process Development and Engineering	PCC	3
CET1180	Chemical Project Economics	PCC	2
XXXXXXX	Chemical Engineering Elective – III (offered by Dept / MOOCS)	PEC	3
XXXXXXX	Chemical Engineering Elective - IV Offered by Dept / MOOCS	PEC	2
XXXXXXX	MDM V: From Sciences and/or any other Engineering / Humanities Discipline	MDM	2
GEP1138	Chemical Process Equipment Design and drawing	PCC	2
CEP1183	Research Methodology-I (Literature Review and Critical Analysis)	RM-I	2
CET1184	Research Methodology - II (Design and Analysis of Experiments)	RM-II	2
CEP1185	Design Project – I	Project	4
CET1182	Honours Course – III (Refinery Science and Engineering)	PCC	3
	Total		25

SEMESTER - VIII

Course Code	Subjects	Course Type	Credits
HUT1254	Industrial and Organizational Psychology	EEM	2
XXXXXXX	Chemical Engineering Elective - V Offered by Dept / MOOCS	PEC	2
XXXXXX	MDM VI: From Sciences and/or any other Engineering / Humanities Discipline	MDM	2
CET1187	Honours Course – IV (Catalytic Science and Engineering)	PCC	4
CEP1186	Design Project – II	PCC	4
CET1188	Honours Course – V (Statistical Thermodynamics)	PCC	3
SEMESTER – VIII (12-16 Weeks)			
CEP1189	Internship / On Job Training		12
	Total		29

CCA Courses (SEM – I and SEM - II)

- Health and wellness
- Yoga
- Sports
- Cultural activities
- NSS
- NCC
- Applied visual performing arts.
- Fine Art – Sketching and Painting
 - Semester – I and II
 - Course Conductor – Dr. Shraeddha Tiwari
- Sport (Kabaddi/Badminton/Volleyball)
 - Semester – II



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CCA-Fine Arts ICT
Institute of Chemical Technology CCA-Fine Arts



Traditional Indian Chemical Technology Under NEP 2020

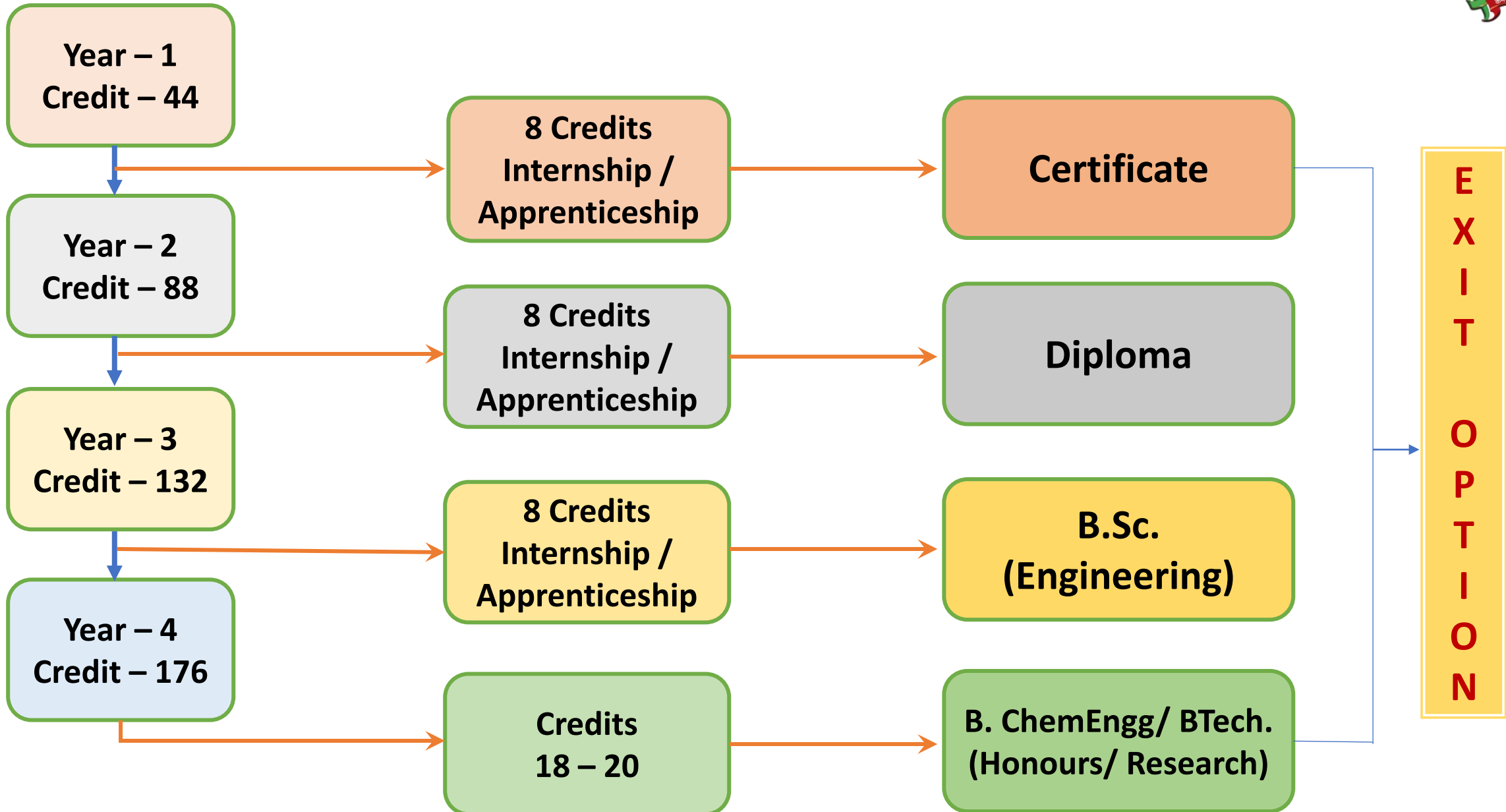


A collaborative IKS course designed with existing expertise in ICT

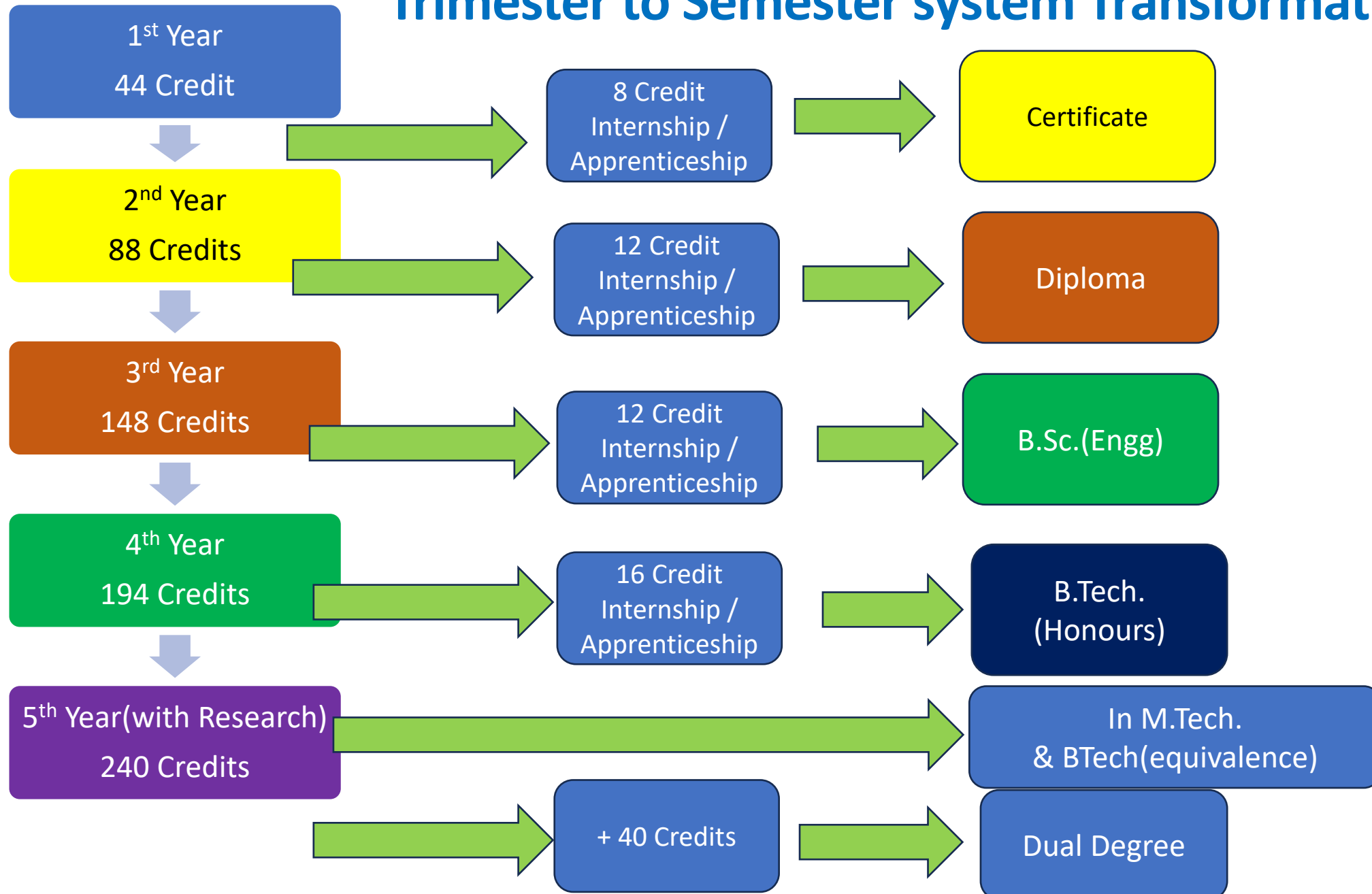
- Traditional Indian knowledge
 - Pharmaceutical Sciences and Technology: Alternative systems of Medicine, Principles of Ayurveda
 - Oils, Perfumery and Flavoring agents
 - Textile and Fibers
 - Dyes, Pigments, mordants and specialty chemicals
 - Polymers and surface coatings
 - Food Technology
 - Metallurgy and Materials Science
 - Preservation Technology
- Science associated with traditional Indian practices during festivals
- Connecting The traditional Indian Knowledge with Modern Science

- Basket of options have been made available for the students on IKS from NPTEL and MOOCs
- Courses have been reviewed by ICT faculty members

Requirements	Action Plan	Person Responsible
IKS	Indian Knowledge System (IKS): Concepts and Applications in Engineering, IIM, Bangalore https://onlinecourses.swayam2.ac.in/imb23_mg53/preview https://ignca.gov.in/divisionss/pg-diploma-course-at-ignca/bharatiya-jnana-parampara/ https://iks.iitgn.ac.in/ https://cisrorg.com/service/short-term-courses/	NEP Advisory Committee
Criteria for selection	Counselling at departmental level	DCs
Issue of forms and Guidelines to students	Implementation of form filling by student for the MOOC courses through MIS	
Registration of students	Approval mechanism by Chairperson BoS through MIS	Academic Office
Time- Table Preparation and resource allocation	No conflict should be for timelines of MOOCs and Institute time table.	Time-Table Committee



Trimester to Semester system Transformation



EXIT
OPTION

4 Years Engg./Tech. Degree Programmes



	Major (Core) Subject comprising Mandatory and Elective Courses	88 Credits (50%)
1	Compulsory Multidisciplinary Minor Subject	14 credits (8%)
2	Generic/ Open Elective Courses (OE)	08 credits (4.5%)
3	Vocational and Skill Enhancement Courses (VSEC)	08 credits (4.5%)
4	Ability Enhancement Courses (AEC),	10 credits (5.7%)
	Indian Knowledge System (IKS)	
	Value Education Courses (VEC)	
5	Internship/Apprenticeship corresponding to the Major (Core) Subject	12 credits (6.8%)
6	Field Projects/Community Engagement Projects	2 credits (1.1%)
7	Co-curricular Courses (CC)	4 credits (2.25%)
8	Honours / Research/ Double Minor	18 - 20 Credits

Multi-Disciplinary Minor Degree Basket of Options



Serial No.	Multidisciplinary Minor Degree in	Department
1	Chemical Sciences	Chemistry
2	Machine Learning and Artificial Intelligence	Mathematics
3	Biotechnology and Bioengineering	Biological Sciences and Biotechnology
4	Pharmaceutical Chemistry & Technology	Pharmaceutical Sciences and Technology
5	Fibres and Textile Processing Technology	Fibres and Textile Processing Technology
6	Food Science and Technology	Food Engineering and Technology
7	Mechanical Engineering	General Engineering
8	Management	Humanities and Management Sciences
9	Materials Science	Physics
10	Polymer Engineering and Technology	Polymer and Surface Engineering
11	Dyestuff Technology	Speciality Chemicals Technology
12	Oils Oleochemicals and Surfactants Technology	Oils Oleochemicals and Surfactants Technology
13	Surface Coating Technology	Polymer and Surface Engineering



Subject Code	Semester	Subject	Credits	Hours/ Week			Marks for various Exams			
				L	T	P	CA	MS	ES	Total
MAT 1501	III	Statistical Computing	2	2	0	0	20	30	50	100
MAP 1601	IV	Data Analytics with R/Python	2	0	0	4	20	30	50	100
MAT 1502	V	Mathematical Methods in AI and ML	4	4	0	0	0	50	50	100
MAP 1602	VI	Machine Learning	2	0	0	4	20	30	50	100
MAP 1603	VII	Deep Learning	2	0	0	4	20	30	50	100
MAP 1604	VIII	AI Project	2	0	0	4	0	50	50	100
		Total	14							600

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)						
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	1	1	1
CO2	3	3	2	2	0	1
CO3	3	3	3	3	0	1
CO4	3	3	2	3	2	1
CO5	2	3	2	3	1	1
CO6	2	3	3	3	2	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

PSO1	Foundation of Mathematics: Strong foundation of Applied Mathematics which is directly connected to solving real life problems in different domains by means of mathematical modelling and analysis.
PSO2	Foundation of Statistics and Data Science: Strong foundation of Mathematics and Statistics of Data science and good hold on various statistical methodologies including probability theory, estimation, and testing of hypothesis etc.
PSO3	Foundation of Computer Programming: Understand and employ modern computational methods of Machine Learning, Deep Learning and Artificial Intelligence and use them effectively using free and proprietary advanced computational platforms for solving large scale problems arising from different research areas.
PSO4	Conduct investigations of complex problems using AI: Use research-based knowledge in machine learning and artificial intelligence and research methods including design of experiments, analysis, and interpretation of data to unfold complex problems from industry and academia and provide intelligent solutions.
PSO5	Project based Teaching Learning: Function effectively as an individual, and as a member in large scale data science projects in multidisciplinary settings involving both academic and industrial research.
PSO6	Societal Applications of AI and ML: Apply reasoning informed by the existing knowledge pool and address various societal issues using Machine Learning and AI tools.



Jalna Campus		Bhubaneswar Campus	
Sr. No.	MDM Program	Sr. No.	MDM Program
1	Food Technology	1	Food Technology
2	Pharma Technology	2	Pharmaceutical Chemistry & Technology
3	Lipids Technology	3	Petroleum and Petrochemicals Technology
4	Materials and Polymers Technology	4	Fibres and Textile Processing Technology
5	Energy Technology	5	Materials and Polymers Technology
6	Petro Technology	6	Energy Technology
7	Chemical Sciences		
8	Physical Sciences		



- NEP Weekly Update Meeting with Coordinators of Mumbai and off campuses
 - Total Meeting Conducted: 22 (1st February – 4th July 2024)
- The Institute of Chemical Technology, Mumbai organized a Faculty Development Program (FDP) on Teaching Pedagogy for new faculty members across the University with to understand various dimensions of NEP
 - It was conducted in a staggered manner during the months of March-April 2024 at ICT Mumbai.
 - This program aimed to enhance the teaching skills, research capabilities, and overall professional development of the faculty members.

Under NEP 2020, the following agenda have been discussed by esteemed speakers:

- Bridging the Gap between industry requirements and University academia using effective pedagogy
- Optimizing Teaching Strategies: Enhancing Student Learning and Educator Effectiveness
- Effective Curriculum Development: Planning, Feedback, and Syllabus Design
- Integrating technology and developing laboratory based teaching styles
- Professional Development plans



Students' Awareness about the MDM Degree And Open Electives



Orientation in a Phased manner between 22nd Feb – 22nd March 2024

Number of Orientation Programmes: 8





ICT Jalna Campus: 23rd March 2024



Sr. No.	MDM Program	Time	Coordinator/ Instructors	Venue
1	Food Technology	10:30 – 11:00 am	Dr. Ramesh Chavan	Auditorium
2	Pharma Technology	11:00 – 11:30 am	Dr. Navnath Hatvate	Auditorium
3	Lipids Technology	11:30 am – 12:00 pm	Dr. Parag Nemade	Auditorium
4	Materials and Polymers Technology	12:00 – 12:30 pm	Dr. Girish Joshi	Auditorium
5	Energy Technology	01:35 – 02:00 pm	Dr. Supriyo Kumar Mondal	Auditorium
6	Petro Technology	02:00-02:30 pm	Dr. Atul Bari	Auditorium
7	Chemical Sciences	02:30 – 03:00 pm	Dr. Manoj Gawande	Auditorium
8	Physical Sciences	03:00 – 03:30 pm	Dr. Girish Joshi	Auditorium

ICT Bhubaneshwar Campus: 2nd and 6th March 2024





Serial No.	Multidisciplinary Minor Degree in	Department	Coordinator	Email
1	Chemical Sciences	Chemistry	Dr. Shraddha Tewari	ss.tiwari@ictmumbai.edu.in
2	Machine Learning and Artificial Intelligence	Mathematics	Dr. Amiya Ranjan Bhowmick	ar.bhowmick@ictmumbai.ac.in
3	Biotechnology and Bioengineering	Biological Sciences and Biotechnology	Dr. Gunjan Prakash	g.prakash@ictmumbai.edu.in
4	Pharmaceutical Chemistry & Technology	Pharmaceutical Sciences and Technology	Dr. Nitin Arote	nd.arote@ictmumbai.edu.in
5	Fibres and Textile Processing Technology	Fibres and Textile Processing Technology	Dr. Santosh Biranje	ss.biranj@ictmumbai.edu.in
6	Food Science and Technology	Food Engineering and Technology	Dr. Jyoti Sagar Gokhale	js.gokhale@ictmumbai.edu.in
7	Mechanical Engineering	General Engineering	Dr. Sachin G Solanke	sg.solanke@ictmumbai.edu.in
8	Management	Humanities and Management Sciences (Proposed)	Dr. Rama Iyar	ramaiyer2008@gmail.com
9	Materials Science	Physics	Dr. Paresh Salame	ph.salame@ictmumbai.edu.in
10	Polymer Engineering and Technology	Polymer and Surface Engineering	Dr. Aarti More	ap.more@ictmumbai.edu.in
11	Dystuff Technology	Speciality Chemicals Technology	Dr. G. Subramanyam	gv.subrahmanyam@ictmumbai.edu.in
12	Oils Oleochemicals and Surfactants Technology	Oils Oleochemicals and Surfactants Technology	Dr. Amit Pratap	ap.pratap@ictmumbai.edu.in
13	Surface Coating Technology	Polymer and Surface Engineering	Dr. Aarti More	ap.more@ictmumbai.edu.in



Department	Semester	Courses
Mathematics	III	Differential Equations and Numerical Methods (MAT1601), Optimization Techniques (MAT2232)
	IV	Discrete Mathematics (MAT1602), Statistical Inference (MAT1603)
	V	Machine Learning (MAT1604), Mathematical Modelling (1605)
Physics	III	Introduction to Nanophysics and Applications (PYT1501)
	IV	Introduction to Materials Science (PYT1401), Introduction to Numerical Techniques using Python (PYT1402), Ceramics Science and Technology (PYT1801)
	V	Solid state Physics (PYT1301), Colour Physics (PYT2301), Introduction to Polymer Physics (PYT1701)
Chemistry	III	Basics in Analytical Chemistry (CHT1013), Organic Synthesis (CHT1105)
	IV	Advances in Analytical Techniques (CHT1014), Interfacial Chemistry (CHT1104), Organic Spectroscopy (CHT1106)
	V	Computational Chemistry (CHT1107), Chemical Kinetics (CHT1103), Organometallic Chemistry and Catalysis (CHT1108)
Biological Sciences and Biotechnology	III	Introduction to Biological Science (BBT1203)
	IV	Fundamental of Applied Biotechnology (BBT1204)

SEM – III (4 Credits)

SEM – IV (2 Credits)

SEM – V (2 Credits)

Choice of the Open Electives ICT Jalna and Bhubaneswar Campus



Subjects	Course Codes	Semester	Course Name	Credits
Biology	BST4251	III	Introduction to Biological Science	02
	BST4252	IV	Fundamentals of Biochemistry & Microbiology	02
Chemical Sciences	CHT4251	III	Analytical Chemistry	02
	CHP4251	III	Analytical Chemistry Laboratory	02
	CHT4252	IV	Advanced Analytical Chemistry	02
Mathematics	MAT4251	IV	Mathematical Modelling	02
Physics	PST4251	III	Engineering Physics	02
	PST4252	IV	Introduction to Materials Physics	02

OE Bhubaneswar Campus

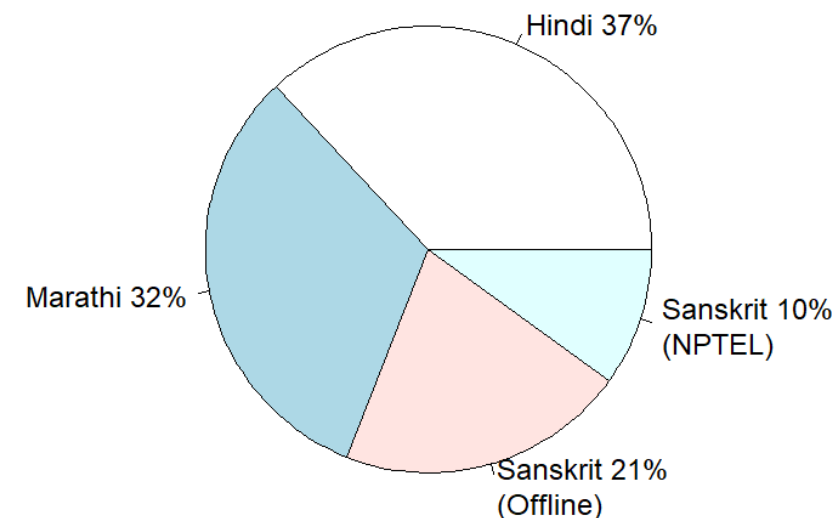
Subjects	Course Codes	Semester	Course Name	Credits
Biology	BST4251	III	Introduction to Biological Science	02
	BST4252	IV	Fundamentals of Biochemistry & Microbiology	02
Chemical Sciences	CHT3251	III	Analytical Chemistry	02
	CHP3251	III	Analytical Chemistry Laboratory	02
	CHT3252	IV	Advanced Analytical Chemistry	02
Mathematics	MAT3251	IV	Mathematical Modelling	02
Physics	PST3251	III	Engineering Physics	02
	PST3252	IV	Introduction to Materials Physics	02



Distribution of MDM, OE and AEC

MDM OE and AEC Distribution

Serial No.	MDM Degree	Offering Department	Number of students	Percentage
1	Chemical Sciences	Chemistry	35	15%
2	Machine Learning and Artificial Intelligence	Mathematics	35	15%
3	Biotechnology and Bioengineering	Biological Sciences and Biotechnology	35	15%
4	Food Science and Technology	Food Engineering and Technology	19	8%
5	Management	Humanities and Management Sciences	35	15%
6	Materials Science	Physics	35	15%
7	Polymer Engineering and Technology	Polymer and Surface Engineering	31	13%
8	Oils Oleochemicals and Surfactants Technology	Oils Oleochemicals and Surfactants Technology	15	6%



Serial No.	Open Electives	Offering Department	Number of students	Percentage
1	Introduction to Nanophysics and Applications	Physics	80	33%
2	Optimization Techniques	Mathematics	15	6%
3	Basics in Analytical Chemistry	Chemistry	63	26%
4	Differential Equations and Numerical Methods	Mathematics	15	6%
5	Introduction to Biological Science	Biological Sciences and Biotechnology	66	28%

Serial No.	AEC Courses	Online/Offline	Number of students	Percentage
1	Hindi	Offline	88	37%
2	Marathi	Offline	76	32%
3	Sanskrit	Offline	50	21%
4	Introduction to Basic Spoken Sanskrit	Online	25	10%



- **AEC**

- Sanskrit (Offline, Visiting Faculty)
- Hindi (Offline, Visiting Faculty)
- Marathi (Offline, Visiting Faculty)
- Introduction to Basic Spoken Sanskrit (NPTEL, Prof. Anuradha Choudry, IIT Kharagpur)

- **IKS**

- Comprehensive list of IKS courses offered by various institutes, MOOCs, NPTEL have been created and made available to the students.
- Traditional Indian Chemical Technology (Offered by ICT Mumbai), **a unique course to understand the ancient chemical technology, first time offered in India.**



Two – Years M.Sc. Programmes
in
First Phase
with effect from
Academic Year 2023 – 24



Illustrative Credit distribution structure for Two Years/ One Year PG (M.A./M.Sc./M.Com.) and Ph. D. Programme

Year (2 Yr PG)	Level	Sem. (2 Yr)	Major		RM	OJT / FP	RP	Cum. Cr.	Degree
			Mandatory	Electives					
I	6.0	Sem I	12-14 (2*4 +2*2 or 3*4+2)	4	4			20-22	PG Diploma (after 3 Yr Degree)
		Sem II	12-14 (2*4 +2*2 or 3*4+2)	4		4		20-22	
Cum. Cr. For PG Diploma			24-28	8	4	4	-	40-44	
Exit option: PG Diploma (40-44 Credits) after Three Year UG Degree									
II	6.5	Sem III	12-14 (2*4 +2*2 or 3*4+2)	4			4	20-22	PG Degree After 3- Yr UG Or PG Degree after 4- Yr UG
		Sem IV	10-12 (2*4 +2 or 3*4)	4			6	20-22	
Cum. Cr. for 1 Yr PG Degree			22-26	8			10	40-44	
Cum. Cr. for 2 Yr PG Degree			46-54	16	4	4	10	80-88	
2 Years-4 Sem. PG Degree (80-88 credits) after Three Year UG Degree or 1 Year-2 Sem PG Degree (40-44 credits) after Four Year UG Degree									

M.Sc. Programmes offered

ICT Mumbai

- M.Sc. Engineering Mathematics
- M.Sc. Chemistry
- M.Sc. Physics (Materials Science)
- M.Sc. Textile Chemistry

ICT Bhubaneshwar

- M.Sc. Chemistry

Four Master's Programme Government of Maharashtra Guidelines



- **On Job Training (OJT) (4 Credits)**
 - Implemented during for 8 – 10 weeks (between SEM – II and SEM – III)
 - Industry exposure to the students and evaluation by experts from both industry and academia
- **Exit Option** after one year with a “**PG Diploma**” degree
- **Student's Choice Based Open Electives**
 - A basket of electives of 26 courses are available from the Department
 - Student can also choose **Open Electives** from the Swayam portal after approval.
 - Depending on interest of the students, new electives can also be offered
- **Strong Research component and practical applications**
 - Compulsory Research Methodology Courses (4 Credit) (SEM – I)
 - Two research projects (SEM – III and SEM – IV)

Course Structure under NEP 2020

Department of Mathematics



Mathematics and Applications	SEM – I	SEM – II	SEM – III	SEM – IV
Foundation Courses in Mathematics	Applied Linear Algebra, Real and Complex Analysis	Differential Equations, Modern Algebra	Measure, Integration and Functional Analysis, Optimization Techniques	Advanced Differential Equations, Mathematical Modelling
Data Science	Statistical Computing	Machine Learning	Deep Learning and AI	Advanced Statistical Computing
Computation & Programming	Computational Mathematics Lab – I	Computational Mathematics Lab – II	Computational Mathematics Lab – III	
Research and Development	Research Methodology		Research Project – I	Research Project – II
Industry Exposure		On Job Training (OJT)		
Student's Choice	Elective – I*	Elective – II*	Elective – III*	Elective – IV*

Course Structure under NEP 2020

Department of Physics



Physics and Materials Science	SEM – I	SEM – II	SEM – III	SEM – IV
Foundation of Physics	Classical Mechanics & Mathematical Physics, Quantum Mechanics I, Solid State Physics	Quantum Mechanics II	Colour Physics, Classical Electrodynamics, Electronics Laboratory	Molecular Quantum Mechanics, Statistical Mechanics
Basics of Materials Science (MS)		Materials Science & Synthesis		Elective -IV
Advance MS and Computational methods	Elective-I	Chemical Physics Laboratory, Materials Characterisation Techniques	Introduction to Nanoscience	Numerical Techniques using Python
Research and Development	Research Methodology		Research Project – I	Research Project – II
Industry Exposure		On Job Training (OJT)		
Student's Choice	Elective – I* (from Materials science)	Elective – II*(from Materials science)	Elective – III*(from Materials science)	Elective – IV*(from Materials science)



MSc Chemistry	SEM – I	SEM – II	SEM – III	SEM – IV
Foundation Courses	Organic Reaction Mechanisms, Chemical Dynamics	Chemistry of Transition Metals, Molecular Thermodynamics	Organic Synthesis, Quantum Chemistry	Solid state Chemistry, Photochemistry and Pericyclic Reactions
Advanced Courses	Instrumental Methods of Analysis	Stereochemistry and Spectroscopy of Organic Compounds	Heterocyclic Chemistry	Organometallic Chemistry and Catalysis
Practical Skills	Organic Chemistry Lab	Inorganic / Instrumental Lab	Physical and Computational Chemistry Lab	
Research and Development	Research Methodology		Research Project – I	Research Project – II
Industry Exposure		On Job Training (OJT)		
Choice-based credits	Elective – I	Elective – II	Elective – III	Elective – IV



- The M.Sc. (Textile Chemistry) program offered by the **Department of Fibres and Textile Processing Technology, ICT Mumbai**, aims to equip students with fundamental knowledge of textile chemistry to solve complex textile processing and testing problems.
- The courses offered in this program involve the study of fibre chemistry and its manufacturing, and chemical processing such as pretreatment, dyeing, printing, and finishing of textiles. It further encompasses the application of various chemicals, dyes, thickeners, and finishing auxiliaries used in the chemical processing of apparel, home furnishing, and technical textiles.
- The Institute of Chemical Technology, Mumbai with the advantage of having expertise in various aspects of Chemical Engineering and Chemical Technology, is an appropriate Institute to run such a program.

Course Structure under NEP 2020

Department of Fibres and Textile Technology



Textile Chemistry	SEM – I	SEM – II	SEM – III	SEM – IV
Basic textile chemistry	Chemistry of natural and man-made fibers		Theory of dyeing	Textile testing and evaluation
Textile wet processing	Chemistry of intermediates and dyes, Chemistry of textile auxiliaries	Pretreatment of textiles, Physicochemical aspects of coloration	Physicochemical aspects of finishing, Textile wet processing machinery	Certifications in textile value chain
Textile practical's	Textile chemicals and fibers analysis	Pre-treatment lab, Coloration of textiles	Finishing of textiles and fastness testing	Analysis and application of auxiliaries and colorants
Research and Development	Research Methodology		Research Project – I	Research Project – II
Industry Exposure		On Job Training (OJT)		
Student's Choice	Elective – I*	Elective – II*	Elective – III*	Elective – IV*

Institute of Chemical Technology, Mumbai

A Multi-disciplinary Environment



- Dynamic & Imaginative Syllabus
- Highly Science based courses & Pedagogy
- Credit based courses
- Rigorous Continuous Assessment
- Well-equipped laboratory
- Soft Skills development
- Inclusive Admissions and Financial Support

- Mandatory Industry Internship
- Industry Relations
- Projects and Consultations
- Alumni Relations
- Community linked projects



- Interdisciplinary Relevant Research
- Excellent Facilities
- Frontier areas of research
- Incubation Centre & Startup Policy
- Creative Combinations
- Research Collaborations

- Motivated and competent faculty
- Academic Freedom
- Access to latest tools in technology
- Best Library facilities
- Active participation

An Institution of Distinct
Repute



Questions and Answers

Thank You

Email: vc@ictmumbai.edu.in
Webpage: <https://www.ictmumbai.edu.in/>
