

1. INTEGRATED M. Tech. IN CHEMICAL ENGINEERING (i-M. Tech.)

i-M. Tech. is unique in its content, character, delivery and outcome. It is new and being introduced in India for the first time. The objective to impart industrial training of two years to all students in different areas and develop entrepreneurial skills. CREATING ENTREPRENEURS AND INNOVATORS instead of job seekers is a prime goal. A variety of opportunities are provided to both students and teachers. During the industrial internship the student will receive stipend/or concessions from industry making the education affordable to one and all.

i-M.Tech. starts after completion of 12th Standard (HSSC, 10+ 2, or equivalent) and is of 5 years duration consisting of 15 trimesters (6 trimesters in industry and 9 in class room on campus) with alternate term in industry, with major degree in Chemical Engineering and minor in 6 different disciplines. It will ensure improved quality and industry-relevance in curricula development for integrated M. Tech. in the field of Chemical Engineering as major branch with minor in Petrochemicals, Textiles, Polymers and Materials, Foods and Pharmaceuticals, and Energy Engineering. The last two trimesters will be for promotion of research problem with experiments which will lead to a design project to promote entrepreneurship and start-up companies. An experience of 2 years in different industries will boost the morale of students, their industry-readiness and placement prospects. Our idea is to place them in all processing industries including software companies, programming, electronics industries, minerals, coal, biotech, etc.

1.1 CAPACITY

The admission to this course is based on JEE (Mains). The capacity is 60.

1.2 SUPERNUMERARY QUOTA

Supernumerary quota for students under Study in India programme has been created. (see Study in India Cell; <https://studyinindia.gov.in/>). Certain number of seats are also created in each programme for NRI, PIO and Foreign students. Students from SAARC countries are also included at a special fee structure. Currently 15% supernumerary seats are created to be distributed equally among three categories adjusting internally.

As stated earlier the programme is a trimester (4-month) system with 3 terms per year. The class of 60 is divided into two batches, Batch A and Batch B with 30 students each. The first trimester in an academic year will begin with 60 students in the class room and will receive training in high level instruments in the fields of Chemistry and Physics, and Mathematics. The syllabus of Chemistry and Physics is so designed as to make the students useful for taking adequate training for industrial internship. The instrumental methods will include theory and experiment on instrumental methods of analysis, typically taught at M.Sc. level and in Mathematics, they will learn MATLAB, Python, C++, R-programming, CAD/CAM. The first term will make them understand the importance of various industries.

Table 1.1: Schedule of Lecture and Work Terms for Batches A and B

Trimester #	Term	Lecture term	Work Term	Comments
1	T1	Batch A + Batch B	None	Both together to learn basics
2	T2	Batch B	Batch A	Batch of 30 each
3	T3	Batch A	Batch B	Lectures of T2=T3
4	T4	Batch B	Batch A	
5	T5	Batch A	Batch B	Lectures of T4=T5
6	T6	Batch B	Batch A	
7	T7	Batch A	Batch B	Lectures of T6=T7
8	T8	Batch B	Batch A	
9	T9	Batch A	Batch B	Lectures T8=T9
10	T10	Batch B	Batch A	
11	T11	Batch A	Batch B	Lectures of T10=T11
12	T12	Batch B	Batch A	
13	T13	Batch A	Batch B	Lectures of T12=T13
14	T14	Batch A + Batch B	8-month Research and Design Project	Entire class graduates
15	T15	Batch A + Batch B		

During T14 and T15 the students will study courses on management, finance, environmental laws, legal issues, entrepreneurship and sustainability and work on a group project called Start-Up Project. The students will be divided in 12 groups with mixture of students from Batch A and B, who would have worked in different industries, and given a project based on research done in ICT. They will repeat experiments to verify data, develop a green process for the given project, collect information on kinetics, reactor design, safety, market, capacity and potential industrial zone, etc. and will prepare a feasibility report to start a company and will be helped to meet venture capitalists.

1.3 MAJOR AND MINOR (i-M.Tech.) PROGRAMME

100% seats are for students from all over India (all States and Union Territories including Maharashtra)

1. Chemical Engineering (Major)
Polymer and Materials Engineering (Minor)
2. Chemical Engineering (Major)
Food Engineering and Technology (Minor)
3. Chemical Engineering (Major)
Pharmaceutical Technology (Minor)
4. Chemical Engineering (Major)
Fibre and Textile Processing Technology (Minor)
5. Chemical Engineering (Major)
Energy Engineering (Minor)
6. Chemical Engineering (Major)
Petrochemical Engineering (Minor)
7. Chemical Engineering (Major)

Chemical Technology (Minor): The student who takes different subjects from the different minor programmes but could not have enough credits to get the single minor degree will be given chemical technology as minor.

1.4 EXAMINATION PATTERN

The examination pattern is 70% marks for continuous evaluation (at least 6 tests depending on performance of the students, of which the best 5 will be considered for grading. The teachers will be encouraged to innovate in testing student's knowledge including computer based test and instantaneous results. The tests will be a blend of fundamentals and application) and 30% weightage will be for the end-trimester examination.

1.5 SELECTION OF BATCHES

The first 30 students in order of merit after the continuous evaluation during the first trimester will be assigned to Batch A and the remaining to Batch B. Thus Batch A goes for the industrial internship during T-2 and Batch A will continue with classes on the campus. Table 1.1 shows the manner in which the terms will be assigned to both batches.

1.6 UG RESEARCH COMPONENT FOR STUDENTS ON THE CAMPUS

Some of the students desirous of getting trained for research will have an opportunity to work with a few professors on the campus during their Lecture Term by putting in extra-hours per week. This training will get adequate credits. A minimum of 20 credits could be so acquired. These extra credits will enable the student to get Honours degree at the end.

1.7. CURRENT INDUSTRIES FOR INTERNSHIP

The very first batch of class 2018-19 from the IOC Bhubaneswar campus has been given internships in the following industries and this list will go on increasing to include industries across the country as well as abroad in future.

Biofermenta Dahej and Kulu		Biofermenta Dahej and Kulu
Gujarat Refinery Baroda		IMMT Bhubaneshwar
IMMT Bhubaneshwar		IOC Gujarat Refinery
IOC Panipat Refinery		IOC Paradip Refinery
IOC R&D Faridabad		Jagannath Polymers Cuttack
Microfilt Umbergaon		Microfilt Umbergaon
NALCO		Oriplast Balasore Odisha
Paradeep Phosphate		RINL Vizag steel

Additional Industries which will take interns during 3rd and 4th Trimesters apart from the above.

Adani Group	BPCL
Dalmia Group Cement	GAIL
HPCL	IFFCO
OPAL Dahej	

This list is not exhaustive and will continue to grow. Very interestingly the industries have liked the Internship Diary prepared by ICT to monitor the student's Progress and some of the students are already assigned research oriented assignments, literature search and report writing. The acceptance of the young students has been enthusiastic and speaks volumes about the quality and content of the i-M.Tech. programme.

When the steady state of the programme is achieved in the fifth year, 150 students will always be in industry throughout the year. Therefore, industrial connectivity is a very strong component of i-M.Tech programme.

1.8 MINOR DEGREE COMPONENT

The award of the minor degree will be decided at the end of the programme depending on the number of credits the student has acquired. It will not be decided in the beginning and thus the student will have a chance of learning lessons from different disciplines and developing interest. This is again a unique feature. If no adequate credits are accrued, then the student gets Major degree with mention of Chemical Technology as the Minor degree.

1.9 VIBRANT SYLLABUS

Since the students will be going to industry, they will have to write reports and credits are given to the student for industrial internship. After the 4th trimester, the students can suggest which new topics should be included in the syllabus in tune with the demands of the industry.

2. ADMISSION PROCEDURE

2.1 ADMISSION TO FIRST YEAR OF INTEGRATED M. Tech. PROGRAM IN FOLLOWING COURSES

All admissions will be conducted by the Institute of Chemical Technology, Mumbai Campus FOR ONLINE ADMISSION FORM.

(<http://www.ictmumbai.edu.in>)

Admission quota for all integrated M. Tech. courses are as follows.

The availability of all the seats for these courses for All India (all States and Union Territories including Maharashtra) shall be based on JEE main paper 1 - 2019.

2.2 INTEGRATED MASTER COURSES OF STUDIES AND INTAKE CAPACITY:

All Integrated courses are passed HSC or its equivalent examination with Physics, Chemistry and Mathematics as compulsory subjects and obtained at least 50% marks in aggregate (at least 45% marks, in case of backward class categories and persons with disability candidates belonging to Maharashtra state only). (Refer Section 1.3)

Reservation:

As per Government of India rules candidates belonging to certain categories are admitted to seats reserved for them based on relaxed criteria. These categories are:

- I. Other Backward Classes (OBC) if they belong to Non Creamy Layer (NCL)
- II. Scheduled Castes (SC)
- III. Scheduled Tribes (ST)
- IV. Persons with Disability (PWD) with 40% or more disability

Benefit of reservation for admission to ICT shall be given only to those classes/castes/tribes which are in the respective central list published by the Govt. of India.

(Refer Section 1.)

2.3 FEES, CONCESSIONS, CANCELLATIONS AND REFUND: COURSE FEES PRESCRIBED:

The candidates admitted during 2019-20 are required to pay fees as prescribed by the State Government. The institutional fees to be paid by all the admitted candidates are as follows:

1	Library Deposit	2,000
2	Fees	90,000
	Total	92,000

*Research contingency of ₹ 12,000 will be added in the fifth year of fees