Indian Institute of Technology Delhi

Department of Chemical Engineering



PLACEMENT BROCHURE 2023-24

Office of Career Services

Message from Head of Department,

Prof. Anil K.Saroha



Our Department has witnessed a number of changes in the recent past. A number of faculty members have retired after long years of contribution to the education and research. Several of them re-joined as Professor Emeritus. And we are perhaps equally, if not more, fortunate in getting outstanding new faculty members so that the eternal cycle of academic life goes on with renewed energy and inevitable evolution of changes. The department has introduced several new undergraduate and graduate courses over the years and dropped old cliché type courses through curriculum review, admitted more number of Ph.D., masters and undergraduate students, received substantial research and infrastructure grants from different sponsoring agencies, brought in new areas of research activity together making it a vibrant and cohesive entity.

A number of students and faculty members have brought laurels to the Department in recent years through their academic and research contributions.

Opportunities are provided to the students at all levels to get acquainted with the latest developments in the various areas of Chemical Engineering. Our Alumni have already made a mark in chemical industries as well as in other corporate fields. I, personally, have very high expectation from our students and value their intellect, skill and determination.

WELCOME TO THE DEPARTMENT

Vision

To build on our strengths and strive for national and international presence in areas of energy, environmental protection, novel materials and healthcare.

To provide and create an enabling ecosystem for students to explore, innovate and smoothly transition into the professional arena.

To build focused research programs networked with industry, institutions, universities and government agencies.

To develop/co-develop effective and affordable technologies scripting joint IPR in partnership with industry, or through consortia leading to spin-offs.

Message from Faculty Coordinators



Prof. Manjesh Kumar



Prof. Gaurav Goel

Chemical engineers play a critical role in our community by improving the daily experience of life through their contributions. It has become even more critical in modern society with increasing needs and sophisticated demands. Quick glance from energy to environment, life to space, chemicals to metals, and chores to wilderness, these professionals are playing inextricable role. To this end, Department of Chemical Engineering is proud to house the talent pool of bright and innovative engineers and researchers to contribute in the journey of nation building.

Department aims at the comprehensive development of students into professionals amenable to the industry and market via a delicate balance of classical fundamentals and shifting technological trends. Program offers flexibility to nurture one's own interest and opportunity to explore new avenues for organic growth. Amalgamation of course work, laboratories, research projects, position of responsibilities, exposure to successful alumni and competitive campus ambiance help us build a confident and quality workforce for job market.

We create new knowledge through post-graduate programs (M.Tech., MS(R), Ph.D.) and deliver those through undergraduate programs (B.Tech. and Dual degree). Overall, we create sustainable pool of bright and enterprising engineers and scientists who are eager to venture into new corporate world. It is but obvious to make the best use of these young minds from the Institute of Eminence (IIT Delhi) to solve the problems of future, strengthen corporation and make a better society.

With this, we hope for a long-term symbiotic relation with the corporate community. We request you all to visit Chemical Engineering at IIT Delhi and provide an opportunity to work with YOU.

Mission

To provide the best education to the brightest young minds in our country.

To offer a wide range of courses that span from fundamental sciences to complex mathematical relationships and engineering design aspects of chemical and biological process technology.

To prepare students to be leaders in whichever field they choose to pursue may it be academia, industry, technology management, entrepreneurship or working for a social cause.

To maintain a vibrant research profile that truly captures the needs and changes of modern society.

WHY OUR STUDENTS

CORE VALUES

- High level of integrity and accountability.
- Focused attention to relevant issues of national and global importance .
- Respect and tolerance of science based disparate ideas.
- Holistic understanding of natural science and engineering for better tomorrow.
- Appreciation and practice of intellectual excellence and creativity.
- Unfettered spirit of exploration, rationality and enterprise.

RESEARCH

Our esteemed PhD students have been conducting impactful research. Additionally, we offer an intensive 18-month MTech thesis program provide an opportunity for students to delve into advanced research.The various broad topics of research include energy, catalysis, multiphase reaction, process intensification, complex fluids, advanced materials, optimization, process modeling simulation & control, environmental engineering and artificial intelligence in industry.





PLACEMENTS

Students take part in placement opportunities in department specific or non- departmental industry. Apart from this, various industry visits and training sessions are organized for the students.

ACTIVITIES

Students actively participate in cultural, literary, social and sports activities where they gain team spirit, interpersonal skills and leadership qualities. It gives an edge to their personality with holistic growth.





DIVERSITY

Students visit and interact with faculties, professionals and students from 140+ universities & Fortune 500 companies worldwide through IIT Delhi MoUs. This diversifies their mental & cultural sphere.

Past Recruiters



OUR COLLABORATIONS

The Department would like to build focused research programs networked with industry, institutions, universities and government agencies. We would like to develop/co-develop effective and affordable technologies scripting joint IPR in partnership with industry, or through consortia leading to spin-offs. The Department strives to promote a technological temperament in society at large, especially to young minds through extensional activities via technology enhanced video and web-based distance learning courses, creation of virtual laboratory and resource centers, and participating in policy making and public debates.

ACADEMIC

JÜLICH Forschungszentrum

Aston University BIRMINGHAM UK

EBRI European Bioenergy Research Institute

Auburn University

National Institute of Biologicals

University of Saskatchewan

NYU

UQ

INDUSTRIAL

Indian Pharmacopoeia Commission

सत्यमेव जयते
Department of Science and Technology
Ministry of Science and Technology
Government of India

Dr. Reddy's

TATA CONSULTANCY SERVICES

ncl

THERMAX

CDSCO

CSIR INDIA

FDA U.S. FOOD & DRUG ADMINISTRATION

Faculty (Chemical Engineering)

PROFESSORS

- **Anil K. Saroha** (Ph.D. IIT Delhi)
- **Anil Verma** (Ph.D. IIT Delhi)
- **Anupam Shukla** (Ph.D. IIT Kanpur)
- **Anurag S. Rathore** (Ph.D. Yale Univ.)
- **Ashok N. Bhaskarwar** (Ph.D. IISc Bangalore)
- **K. K. Pant** (Ph.D. IIT Kanpur)
- **Jayati Sarkar** (Ph.D. IIT Kanpur)
- **Manojkumar C. Ramteke** (Ph.D. IIT Kanpur)
- **Paresh P. Chokshi** (Ph. D. IISc Bang.)
- **Rajesh Khanna** (Ph.D. IIT Kanpur)
- **Shalini Gupta** (Ph.D. North Carolina State University)
- **Shantanu Roy** (Ph.D. Washington University USA)
- **Sharad K Gupta** (Ph.D.Polytechnic Institute of New York)
- **Suddhasatwa Basu** (Ph.D. IISc Bang.)
- **Sreedevi Upadhyayula** (Ph.D. NCL Pune & IIT Kharagpur)
- **Sudip K. Pattanayek** (Ph.D., IIT Bombay)

  Vikram Singh (Ph.D. Cornell Univ., USA)
- **Vivek V. Buwa** (Ph.D. IIT Bombay)

ASSOCIATE PROFESSORS

- **Divesh Bhatia** (Ph.D. University of Houston USA)
- **M. Ali Haider** (Ph.D. University of Virginia USA)
- **Hariprasad Kodamana** (Ph.D. IIT Bombay)
- **Gaurav Goel** (Ph.D. University of Texas USA)
- **Abhijit Raj** (Ph.D. University of Cambridge, UK)

ASSISTANT PROFESSORS

- **M.K.S Verma** (Ph.D. IISc Bangalore)
- **Manjesh Kumar** (Ph.D. University of Houston)
- **Somnath Ghosh** (Ph.D. University of Twente, Netherlands)
- **Vikrant** (Ph.D. Eindhoven University of Technology, Netherland)

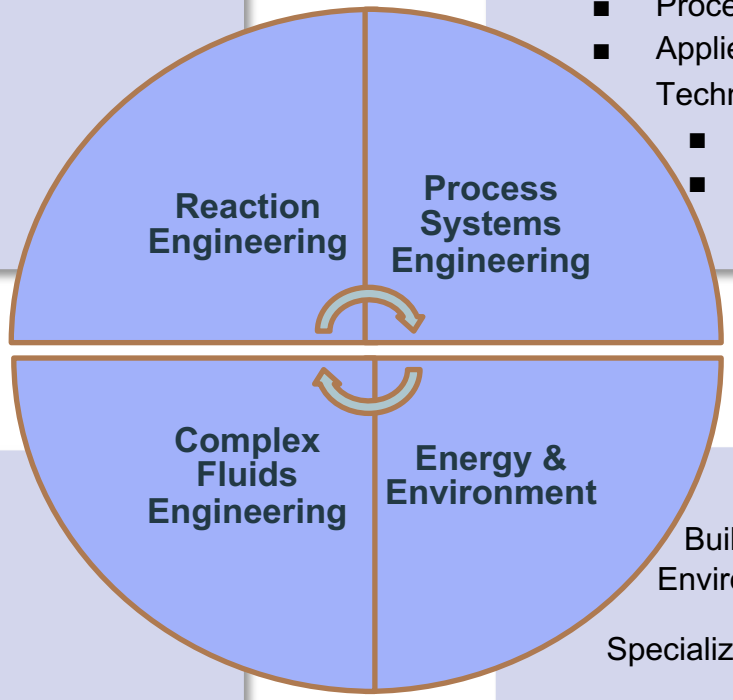
Department Specialization Courses

Builds on foundation in Chemistry and Materials
Specialization core courses include:

- Catalysis & Multiphase Reactors
- Thermodynamics
- Mass Transfer Operations
- Catalysis Modelling
- Chemical Product development and commercialization

Builds on foundation in Mathematics, Computing and Engineering Systems
Specialization core courses include:

- Instrumentation and Automation
- Process Plant Design
- Applied Mathematics & Computational Techniques
  - Computational Fluid Dynamics
  - Optimization & Control



Builds on foundation of Mathematics, Physics and Materials
Specialization core courses include:

- Complex Fluids & Fine Chemicals Technology; Simulation Techniques
- Fluid Particle Mechanics
- Transport Phenomenon
- Interfacial & Crystal Engineering
- Colloids & Aerosols
- Polymerization Process Modeling

Builds on foundation in Physics, Chemistry, Environment & Electrical Engg.

Specialization core courses include:

- Storage devices & Characterization Method
- Hydrogen Energy & Fuel cell Technology
- Air Pollution Control Engineering
- Molecular Modeling of Catalytic Reactions
- Petroleum Refinery Engineering

RESEARCH DOMAINS

Chemical Engineering at IIT Delhi represents the diverse domains of research and development activities. We draw the relevance of these research pursuits by tackling challenges pertinent to needs and expectation of Indian chemical industries and society. Our research interests are aligned to solve problems dealing with physical, chemical, ecological, and biological systems that falls in the domain of chemical engineering. To ensure the sustainable growth, we maintain the suitable balance of researchers that focus on simultaneous investigations of both fundamental and pragmatic aspects of the problems at hand. This objective is achieved following the principles of research triad, namely, Estimation- Experimentation-Implementation. The guiding principles inherently suggest our willingness to collaborate and to discern the barriers at the interface of various fields by interdisciplinary works. We strongly recommend various institutes, corporations, government entities, and individuals to connect with our research team to start a new scientific journey, to generate a new technology, and to provide a new product for a better living standard of our community.

Physical Systems

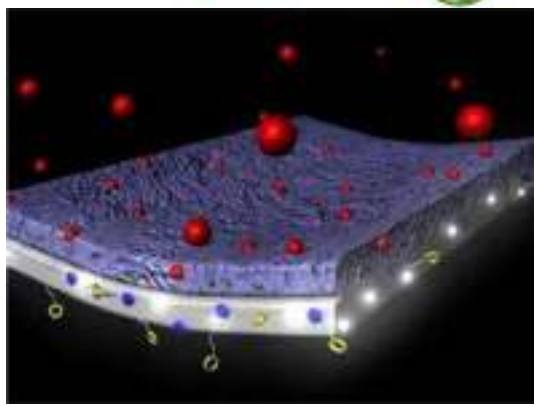
Chemical Systems

Ecological Systems

Biological Systems









Physical Systems

- The Physical Systems research in chemical engineering takes a holistic, life cycle view of the manufacturing process.
- It begins with molecular discovery and scales up to the other end of the spectrum concerning manufacturing excellence and environmental impact minimization.
- The research focuses on various individual steps in the life cycle of process engineering.
- Researchers also laid emphasis on the machine learning domain, where fault detection of process systems, band-gap prediction, and process control of mAb production were carried out.
- Both theoretical and application perspectives are taken into account when investigating these steps.

System Design and optimization

- Model predictive control, reinforcement learning
- Fault detection and Diagnosis in Chemical Process Plants
- ML/DL/NLP based models for chemical process

Thermo and Molecular Simulations

- Materials
- Bio-inspired Systems
- Reservoir Simulations

Transport Process and Complex Fluids

- Computational Fluid Dynamics
- Complex Fluids
- Interfacial Engineering

Chemical Systems

- The Chemical System research group excels in both theoretical and experimental research, employing a mix of classical and modern techniques to target commercially important applications.
- The group's research areas encompass traditional fields like catalysis and reaction engineering delving deep into development of modified catalyst and oxidative coupling of methane, along with modern disciplines like polymer and advanced material science.
- They explore advanced energy technologies such as fuel cells, green electro-synthesis of new products, and the synthesis and characterization of catalysts for fine chemicals.
- Specific research projects focus on issues unique to India, such as the underground gasification of high ash content coals and the provision of smart engineering solutions to Indian industries.
- The group's expertise extends to both theoretical aspects (like computational modeling of industrial and bio-reactors) and experimental aspects (like performance evaluation of scaled-down reactors and electrochemical systems, and catalyst synthesis and characterization).

Catalysis and Reaction Engineering

- Reactor Modelling and multiphase reactors
- Catalysis and Adsorbents
- Hydrodynamics of Multiphase Reactors
- Supercapacitor
- Material synthesis and Crystal growth

Polymer and Advanced Materials

- Multiphase flow in Porous Media
- Crystal Materials
- Nanomaterials and Nano-engineering
- Polymer Nano-composites

Ecological Systems

- The Energy, Environment, and Sustainability sector focuses on current research topics like non-fossil energy, industrial energy, climate, and environment.
- Among the central subjects of research in the energy field are biomass and biofuels, fuel cells, solar power, energy analysis, combustion systems and pollution control.
- A significant portion of research is dedicated to biomass and biofuels, which deals with the conversion of bio-mass to value-added chemicals and also for Hydrogen production.
- Another important area being focused upon is the pollution control where exhaust emissions using micro-emulsions and synthesis of micro-porous carbon absorbents is carried out.
- Researchers are striving to boost biomass productivity via metabolic engineering and to enhance fuel output and selectivity through enzyme modifications.
- The sector aims to achieve techno-economic feasibility in the field of biofuels through the use of optimization methodologies.

Environmental Engineering

- Clean Fuel Technologies
- Biomass and Bio-Fuels
- Climate, Environment and Sustainability
- Membrane Science and Engineering
- Air Pollution Control
- Energy storage and Fuel Cells

Biological Systems

- The Biological Systems research primarily focuses on disease and health, biomaterials, development of bioengineering tools, bioenergy, and systems analysis. This includes in-depth studies on cancer signaling pathways, whole-body human metabolism, cell culture engineering, and the study of antibiotic resistance and stress response in pathogens.
- A significant area of focus is the development and characterization of biomaterials, especially nanostructured materials, and their application to healthcare and manufacturing processes. This involves the study of their structure and properties.
- The research has a special emphasis on the innovative use of these biomaterials, including the development of micro-devices, nano-composites for medical use, drug delivery systems using nanoparticles, bioreactors and scaffolds, as well as exploring the use of nanoparticles in alternate and traditional medicine.

Biomolecular Engineering

- Biotechnology
- Biomaterials
- Bioseparation
- Bio Sensor
- Computaional biophysics

Biopharmaceutical

- Upstream Manufacturing of biotherapeutics
- Downstream Processing
- Drug delivery systems
- Protein-protein interaction
- Process Analytical Technology

LAB FACILITIES





- Electrochemical and Fuel Cell Lab
- Interfacial and Nano-science Lab
- Sustainable Energy Research Lab
- Membrane Separation Lab
- Complex Fluid Lab
- Advanced Flow Characterization Lab
- Process simulation Lab
- Catalytic Reaction Engineering Lab
- Biosensors and Nano-materials
- Macromolecules and Interfaces Lab
- Computational Flow Modeling Lab
- Renewable Energy and Chemicals Research Lab
- Air Quality and Research Lab
- Fluid Flow through Porous Media Lab
- Heterogeneous Catalyst Synthesis & Reaction Engg





Scientific Analytical Equipments

- Centrifuge
- Sonicator
- Furnace
- Bioreactor
- Akta Avant
- Akta purifier
- HPLC
- 2D Gel Electrophoresis
- Texture Analyzer
- Vacuum Oven
- UV Spectrophotometer
- XRD
- FTIR
- BET surface Area Analyzer
- Anton Paar MCR 302 Rotational Oscillatory Rheometer
- Quartz Crystal Microbalance (QCM)
- Goniometer
- Fluorescence & Polarized Optical Microscope
- Potentiostat Galvanostat
- Microcalorimeter
- Fuel Cell Test Station
- DTA Thermogravimetric Analysis (TGA)
- Electrochemical Quartz Crystal Microbalance
- Scanning Electrochemical Microscope
- Optical Microscope (BX53) with fluorescence and phase contrast
- Surface Plasmon response spectroscope
- IV- Sourcemeter
- GC-FID & TCD
- UV-Visible spectroscopy
- Surface Area Analyzer
- Micromeritics Pulse Chemisorption
- Infrared Moisture Determination Balance
- GC-MS
- TG-DTA
- DIP-Coater
- DV-III Ultra Viscometer

Computational Skills / Software

SimCAD Simulation Software

Ansys

AUTODESK AUTOCAD

OpenFOAM®

DWSIM Chemical Process Simulator

b-initio VASP ienna ackage imulation

TensorFlow

COMSOL MULTIPHYSICS®



MATLAB

PyTorch

SOLIDWORKS SIMULATION

MRST TRANSFORMING RESEARCH

AMBER MD

AVL FIRE®

accelrys

MATERIALS STUDIO

aspentech

GROMACS FAST. FLEXIBLE. FREE.



LBM LIFT OFF

GSAS-2



VMD

SOL

Matching of Skill Sets with Suitable Job Roles

The department of chemical engineering at IIT Delhi is a staunch believer of the fact that a budding mind blooms beautifully when it is provided a competitive ambiance comprising of creativity, intellect, teamwork, and skill.

What we Expect?

We expect that our students should be placed in a prestigious company such as yours so they can contribute efficiently and effectively in the development of the company. Therefore, our department will be highly elated to include your name in the esteemed list of recruiters.

In order to facilitate the recruitment process, the department will provide all possible logistical help required in conducting screening tests and conducting pre-placement talks and interviews. Thus, it is our humble request to consider our students as potential employees for your company.

Placement Procedure

1. Interested companies contact Faculty Coordinator or placement officer, Office of Career Services (OCS) for a Job Notification Form (JNF) at placement@admin.iitd.ac.in

2. JNF requires the companies to fill in mandatory details of the job profile –role offered, pay package, place of posting, eligible departments.

3. Once the filled-in-JNF with all the required details is received, companies are assigned username/password to access their online account on OCS website

4. Companies are also assigned space on the server on which they may upload any presentation, videos, data or other information they want the students to see.

5. The JNF has to be frozen on the OCS website Interested companies contact Faculty Coordinator or placement officer, Office of Career Services (OCS) for a Job Notification by the company till a deadline, after which the students shall be able to view all the details, and the eligible students may apply.

6. After the application deadline for the students, the resumes are visible to the company. The company submits shortlist on its online account before a deadline

7. Shortlisted students get notified. The placement office allots the dates for the campus interviews.

8. After the completion of the selection procedure on campus, company is required to announce the final list of the students on the same day itself.

9. If a student is selected, the job is registered against him/her and he/she would not be allowed to appear for more interviews as per placement policy.

CONTACT US

Our Head of Department (HOD, Chemical Engineering)



Dr. Anil K Saroha
+91 11 2659 1032
aksaroha@chemical.iitd.ac.in

Our Faculty Coordinators



Dr. Gaurav Goel
Faculty Coordinator (PG)
+91 11 2659 1025
goelg@chemical.iitd.ac.in



Dr. Manjesh Kumar
Faculty Coordinator (UG)
+91 11 2659 1117
manjeshkumar@chemical.iitd.ac.in

Our Student Coordinators



Umang Goswami
Student Coordinator (PhD)
9584263648
chz208402@iitd.ac.in



Kriti Manocha
Student Coordinator (PG)
6351979537
che222129@iitd.ac.in



Saptarshi Banerjee
Student Coordinator (UG)
8882662289
ch1211045@iitd.ac.in

Phone **: +91 11 26591021 (O)**

Email **: hodchemical@admin.iitd.ac.in.** **Visit us at http://chemical.iitd.ac.in/**