DEPARTMENT OF CHEMICAL ENGINEERING

About The Department

Established in 1963, the Department of Chemical Engineering started with an undergraduate program. Currently, it offers courses to cater the needs of Processing Industries, Designing sector and Allied Industries. It provides a unique infrastructure for both B.Tech and M.Tech students. A Master's course in Equipment and Plant Design started in 1970. Later on, two new post graduate courses in Industrial Pollution Abatement and Advanced Transfer Processes were inducted. Subsequently, the specialization of Equipment and Plant Design was redesigned to Computer Aided Process Plant Design. A five-year integrated program on Hydrocarbon Engineering offering dual degree of B.Tech. (Chem. Engg.) and M.Tech. (Hydrocarbon Engineering) has been started from the session 2003-04. It is the first department in the country to have started an innovative Masters program in Industrial Pollution Abatement and Industrial Safety and Hazards Management. It is also the first department in the country to have started the Integrated Dual Degree program. Since the transformation of the University of Roorkee into an IIT, the Department has been engaged in the development of academic teaching and research infrastructure, creation of laboratories in analytical/instrumental analysis, modeling and simulation, safety and hydrocarbon engineering. With highly equipped labs it offers a platform for research initiatives in diverse areas of Chemical Engineering. The recent developments in sister disciplines and biological sciences have been embedded in the curricular structure and are being adopted in our research activities. It has a collaboration with a number of national and international institutions, R&D and consultancy organizations and provides consultancy to several firms in varied sectors. The year 2012-2013 is being celebrated as the Golden Jubilee year for the completion of 50 years of Chemical Engineering department. It has organized an International Conference on 'Advances in Chemical Engineering-2013'.
Presently, there are 21 faculty members guiding about 40 research scholars in diverse areas of chemical engineering. 52 students are in 4th year B.Tech program and 20 in IDD program.

Research And Facilities

Areas of Expertise

- Process Modeling & Simulation
- CAD
- Process Control & Heat Transfer
- Environmental Engineering
- Hydrocarbon Engineering
- Adsorption
- Bio fuels
- CFD of Non-Newtonian Fluids
- Heat Transfer
- wastewater treatment
- environmental biotechnology
- Optimization
- Design & Control
- Biomass gasification.
- Integrated energy systems
- Pinch Technology

Projects

- Treatment of Pulp and Paper mill effluent through Catalytic Wet air Oxidation
- Modernization of the Pollution Control Laboratory
- CFD Modeling of Chemical Process Equipment
- Cleaning of Potable water- Removal of Arsenic from Drinking Water
- Development of High Rate Biomethanation Processes as means of Reducing Green House Emission for Energy Recovery from Urban, Municipal and Industrial Waste

Laboratories

- Industrial Pollution Abatement
- Mass-Transfer Research Laboratory
- Hydrocarbon Research Laboratory
- Fluid – Particle Research Laboratory
- Reaction Engineering Research Laboratory
- Process Control and Instrumentation Laboratory
- Instrumental Analysis Laboratory
- Biochemical Engineering Laboratory
- Heat Transfer Laboratory
- Fluid Mechanics Laboratory

Major Equipment/Facilities

- Chemical Engineering Flow Sheeting & Process Equipment Design
  - ASPEN ENGINEERING SUITE
    - HYSYS
      - Pro II
  - Computational Fluid Dynamics Software
    - CFX
    - FLUENT
    - PHOENICS
  - PDE solvers
    - FEM-LAB
    - PDEease 2d
  - Optimization software - GAMS
  - Finite element method - COSMOS/M
  - Pinch analysis - SUPERTARGET
  - Simulation Softwares - FCCU & CDU
  - Calorimeter
  - IR analyzer
  - Viscometer and Rheometer
  - High Pressure batch reactor
  - Gas Chromatograph (GC)

Academic Programmes

Undergraduate

Four Year B.Tech

The four year B.Tech programme comprises of courses divided in three distinct areas namely: Institute Core, Department Core and the Departmental and Institute Electives.

The institute core courses are common to all B.Tech programmes and are planned to give the students a firm base. These include courses on Mathematics, Physics, Chemistry, Behavioral Sciences and Technical Communication.

The departmental core consists of courses considered essential for chemical engineering including laboratory courses, practical training and a major project.

The institute electives are the courses offered by different academic Departments/ Centers to the students of other disciplines. The students are free to select a number of courses from a basket of courses offered.

Five Year Integrated Dual Degree

The IDD program comprises of all the above courses of B.Tech Program. In addition it provides for specialized courses in Hydrocarbon Engineering. This program was incorporated in 2003-2004 to meet the growing demands in the field of hydrocarbons. The students also have to submit a dissertation in the fifth of this program.

Postgraduate

2 Year M.Tech Program

The programme structure involves two semesters of course-work and two semesters of non-thesis and thesis work. Through course-work advanced level courses of Chemical Engineering are taught and the performance of students is evaluated at the end of each semester. A twelve month long intensive non-thesis and thesis work ensures that students tackle live industrial problems and perform cutting edge research. Projects normally include a wide choice of experimental research, computer modeling and real life problems. Assessment is done by means of round the year performance evaluation, report analysis and oral presentation. The department is equipped with sufficient facilities for this purpose.

Currently the department provides M.Tech in 3 fields:

Computer Aided Process Plant Design (CAPPD)

Industrial Pollution Abatement

Industrial Safety and Hazards Management (ISHM)

Academic Curriculum

Undergraduate Programmes

List of courses

- Principles and Application of Thermodynamics
- Transfer Processes I & II (Heat Transfer and Mass Transfer)
- Transport Phenomenon I & II
- Reaction Engineering
- Fluid Mechanics
- Chemical Technology
- Process Equipment Design
- Chemical Process Dynamics and Advanced Process Control
- Process Modeling and Simulation
- Process Economics and Plant Design
- Industrial Instrumentation
- Petroleum, Petrochemicals & Polymer Science & Technology

Integrated Dual Degree (IDD) with B.Tech.(Chemical Engineering) and M.Tech (Hydrocarbon Engineering). This Programme has all the essential ingredients of the B.Tech (Chemical Engineering) Programme besides the following courses related to Hydrocarbon Engineering:

- Reservoir Engineering
- Distillation Processes
- Natural Gas Engineering
- Hydrocarbon Processing & Engineering I & II
- Oil & Gas Transport
- Refinery Optimization
- Advanced Control Strategy in Hydrocarbon Industry
- Petroleum Refining and Petrochemicals
- Process Intensification in Hydrocarbon Industry

Postgraduate Programmes

List of courses

- Computer Aided Process Plant Design
- Oil and Gas Transport
- Process Integration
- Transport Phenomena
- Chemical Reactor Analysis
- Modeling of Chemical Engineering Systems
- CAD of Heat and Mass Transfer Equipment
- Optimization of Chemical Processes
- Process Design and Control
- Biochemical Engineering
- Advanced Mathematics
- Advanced Mathematics
- Transport Phenomena
- Chemical Reaction Engineering
- Modeling of Pollution Control Systems
- Air Pollution Control Engineering
- Water Pollution Engineering
- Environment & its Protection
- Industrial Safety & Hazards Management
- Biochemical Engineering
- Environmental Impact Assessment
- Reservoir Engineering
- Industrial Safety and Hazards Management
- Advanced Mathematics
- Transport Phenomena
- Chemical Reaction Engineering
- Modelling of Process Safety Control Systems
- Optimization of Chemical Processes
- Chemical Reactor Analysis
- Industrial Safety & Hazards Management
- Reliability Engineering
- Fire Science & Engineering
- Design of Safety Systems
- Hazardous Waste Management

For detailed course structure/syllabi please refer the link :
<link>
http://www.iitr.ac.in/departments/CH/pages/Academics+Course_Structure+Course_Structure_UG.html

Past Recruiters

List the companies

1. ADP PRIVATE LIMITED.
2. ADVAIT LIFE-EDUCATION.
3. AIR LIQUIDE.
4. ALLEN CAREER INSTITUTE KOTA, (OFF CAMPUS)
5. ANSYS-FLUENT INDIA PRIVATE LIMITED.
6. ARICENT TECHNOLOGIES (HOLDINGS)Ltd.
7. AXIOM EDUCATION (P)Ltd.
8. BRITISH GAS EXPLORATION AND PRODUCTION INDIA Ltd.
9. COAL INDIA Ltd
10. COROMANDEL FERTILIZERS Ltd
11. CONTATA SOLUTIONS Pvt.Ltd.
12. DELOITTE.
13. Dr. REDDY'S LABORATORIES LIMITED.
14. DSCL ENERGY SERVICES COMPANY LIMITED.
15. EDUVISION INDIA SERVICES
16. ESSAR GROUP.
17. FLUENT INDIA Pvt.Ltd.
18. FLOWMASTER INDIA Pvt . Ltd.
19. FUTURE FIRST INFO SERVICES Pvt.Ltd.
20. GAIL (INDIA)Ltd.
21. GENSOL CONSULTANTS Pvt.Ltd.
22.GRASS ROOTS RESEARCH & CREATION Pvt .Ltd.
23.GS ENGINEERING & CONSTRUCTION INDIA Pvt. Ltd.
24. HINDUSTAN LEVER LIMITED.
25. HINDUSTAN ZINC
26. HPCL
27. IBM-IRL
28. INDIAN OIL CORPORATION LIMITED
29. INREA RESEARCH SOLUTIONS PRIVATE LIMITED.
30. iRUNWAY
31. JAYPEE INDIA.
32. JINDAL STEEL & POWER Ltd.
33 J.P. MORGAN CHASE SERVICES 34.KAIRAUS SOFTWARE Pvt.Ltd
35.KOTAK MAHINDRA OLD MUTUAL LIFE INSURANCE LIMITED
36.LARSEN & TOUBRO LIMITED.
37.MARKET Rx INDIA Pvt.Ltd.
38.MAWANA SUGARS Ltd.
39.MECCADEMIA
40.MN DASTUR & COMPANY(P) Ltd.
41.M/s NESTLE INDIA LTD (TECHNICAL MANAGEMENT TRAINEE).
42.M/s tBITS GLOBAL Pvt Ltd.(JUNIOR TECHNICAL ARCHITECT)
43.M/s tBITS GLOBAL Pvt Ltd.(PROJECT LEAD).
44.NATIONAL COUNCIL FOR CEMENT & BUILDING MATERIALS FOR M-.TECH ENVIROMENT
45.OIL INDIA Ltd.
46.ORACLE INDIA PRIVATE LIMITED (APPLICATION DEVELOPMENT).
47.PATNI COMPUTER SYSTEMS Ltd.
48.PRICE WATERHOUSE COOPERS
49.RELIANCE INDUSTRIES LIMITED.
50.SCHLUMBERGER ASIA SERVICES Ltd.
51.SHELL TECHNOLOGY INDIA Pvt . Ltd.
52.SRF Ltd.
53.STEEL AUTHORITY OF INDIA LIMITED.
54.TATA STEEL Ltd.
55.TATA STEEL R&D & TECHNOLOGY GROUP.
56.TCE CONSULTING ENGINEERS LIMITED
57.TCS
58.TCS-CTO
59.TECHNIP KT INDIA Ltd
60.UOP INDIA PRIVATE LIMITED
61.VEDANTA
62. WYVIL SYSTEMS INC

Message from The Head of Department

Words from HOD

Department of Chemical Engineering at IIT Roorkee houses an excellent and dedicated faculty and staff members, state-of-the-art laboratories and a huge number of meritorious students pursuing B.Tech, M.Tech, IDD and Ph.D programs. The students are trained in diverse areas of Chemical Engineering through lectures, tutorials, mini and major projects etc. They do get trained in real life work environment through summer internships in various industries and universities. The broad training imparted to the students coupled with their innate quality prepares them to meet more than adequately any challenge in their professional life. The alumni of this department have proven their competence by excelling in some of the most competitive environments around the globe, be it in the industry or in academia. Continuing with the legacy, the current B.Tech, IDD and M. Tech batches have many innovative and enterprising minds. As the Head of Department, I proudly present the current final year batch to all potential recruiters.

Those who have hired our students in the past are already familiar with the high standards our alumni have set. For new recruiters, we are confident that the excellence of the current batch will catalyze the beginning of a long and prosperous relationship with IIT Roorkee.

Prof. Vijay K. Agarwal
Head of the Department
Department of Chemical Engineering

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