

Department of Chem Engg @ IIT Delhi

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Our Vision



Global leadership in technology development for healthcare, energy, environment, and novel materials



Innovation in education via technology enhanced video and web-based distance learning courses

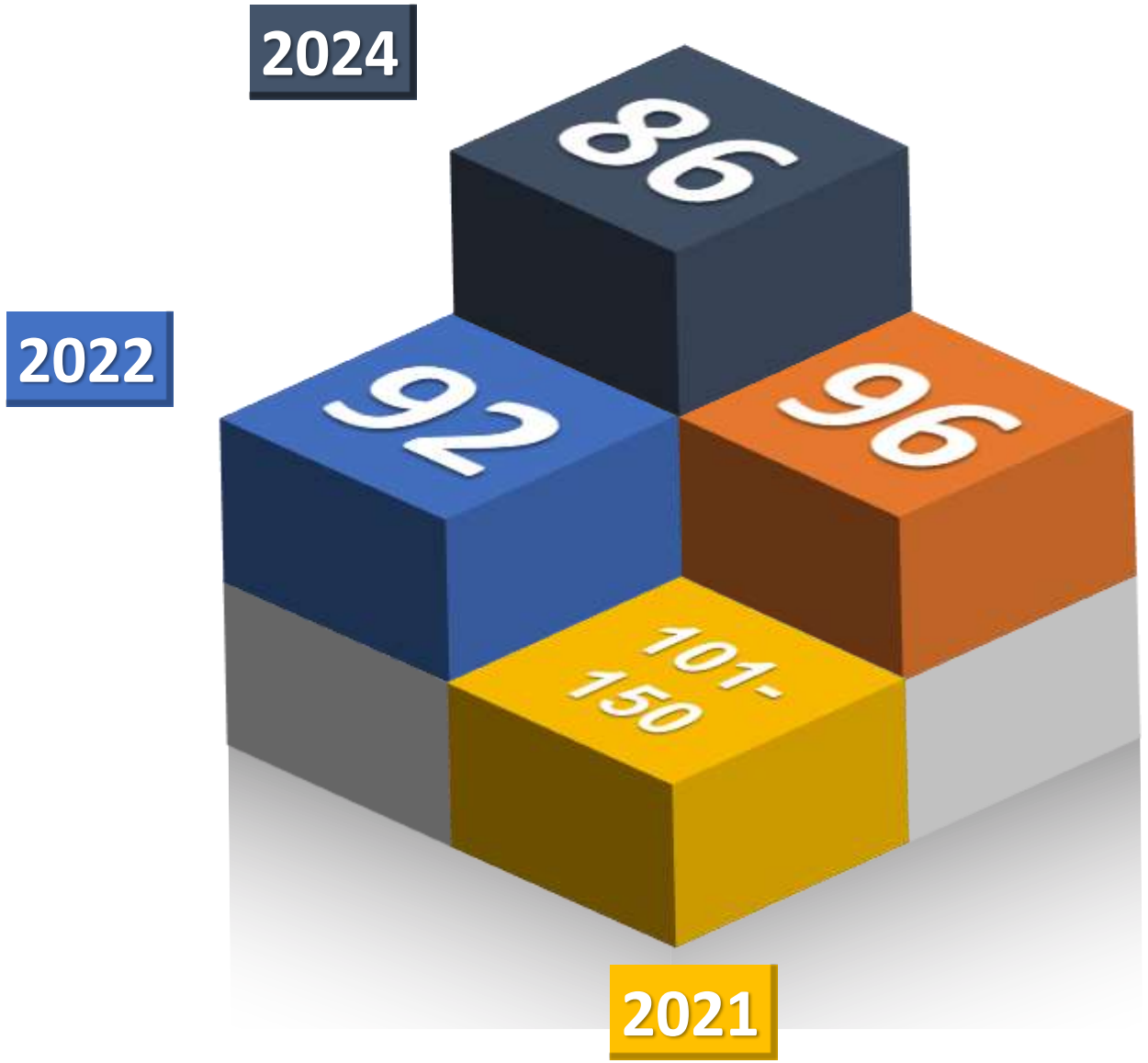


Offer an ecosystem for students to explore and innovate to facilitate successful professional transition



Participate in policy making and public debates and cater to societal needs

Department Ranking (QS Subject Ranking)



Top 50 by 2030



Department Initiatives



Research

- High impact publications
- Work in more cutting-edge & society-relevant research areas
- > 100 Cr of funding in past 10 years



External interactions

- International conferences and workshops
- Industry
- Alumni



Academia

- Exchange programs
- Align existing programs with industry needs



Industry collaborations

- Research collaborations
- Student internships and placement
- Filing of IPRs



Startups

- Edna
- Growdea
- NanoDX
- WowChemE
- Avatt

Department Faculty

PROFESSORS



Department Faculty

ASSOCIATE PROFESSOR

Abhijeet Raj



Vikram Singh



Hariprasad Kodamana



ASSISTANT PROFESSOR

Manjesh Kumar



Vikrant



M.K.S. Verma



Somnath Ghosh



Rousan Debbarma



Sankalp Nambiar



OTHERS

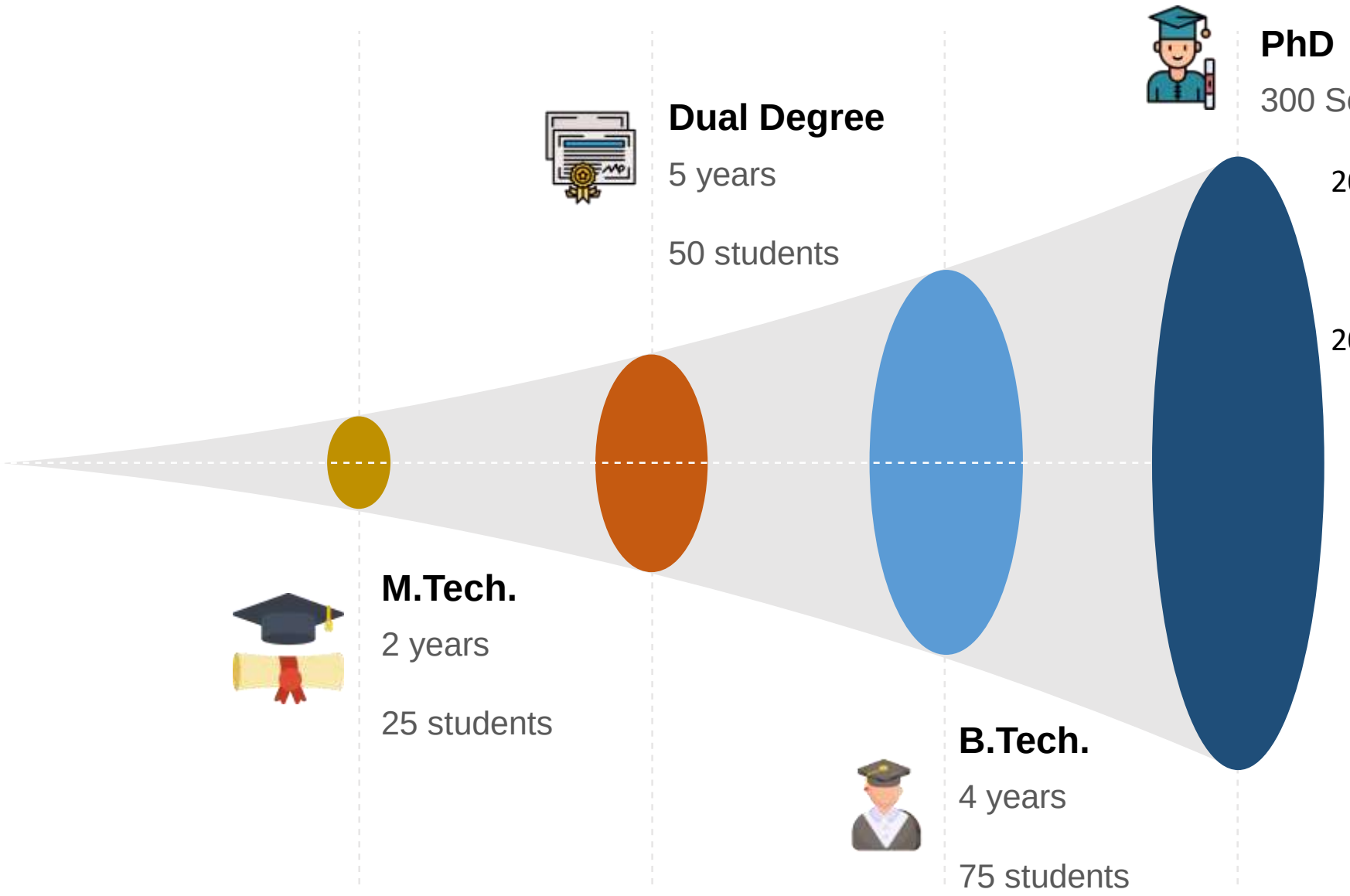
K. D. P. Nigam
Honorary Professor



Ratan Mohan
Adjunct Professor

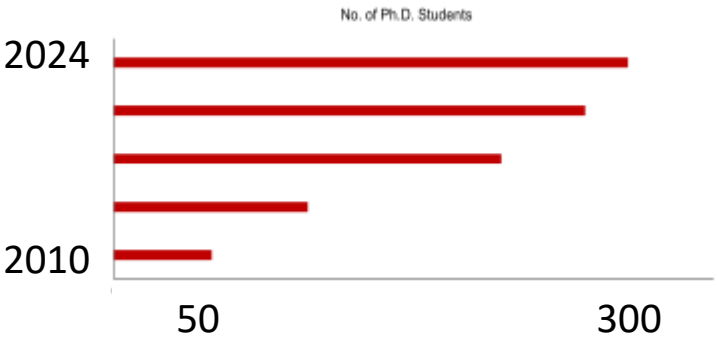


Our Students



PhD

300 Scholars



Dual Degree

5 years

50 students

M.Tech.

2 years

25 students

B.Tech.

4 years

75 students

Programs

Centers of Excellence (COEs)



DBT COE for Biopharmaceutical Technology (CBT) since 2015

- *Continuous processing in the biotech industry*
- *Digitalization of continuous processing and data analytics*
- *Biosimilar characterization*
- *Novel biologics, biosimilars, and formulations for biotherapeutics*
- *Pharmacoeconomics*

Process Safety and Risk Management (sponsored by Nayara Energy Ltd.)

- *Promoting education, research, and development;*
- *Developing expertise and knowledge in Process Safety and Risk Management*
- *Building awareness about process safety and risk management through conducting training, workshops, and other educational programs*
- *Providing consultancy services to industries, institutions, and others*



DST COE for Energy Storage Platform on Batteries (ESPOB) since 2018

- *Flow and Li, Na, and Mg-ion batteries*
- *Supercapacitors and electrolyzers*
- *Fuel cells*
- *Lithium recovery*

Industry and Academia Partners (> 40 Cr in 10 years)





GROWDEA
Grow An Idea!

Drug Discovery Platform with Hardware

NanoDx
where diagnostics meets nanotechnology

Nanotechnology based diagnostics

H2DC12 AVENUE
Decarbonize India

Edna BioLabs

Edna BioLabs produces specialty enzymes for the Indian and global market



Flow batteries, fuel cells, cell components and customized devices

Entrepreneurial activity

WowChemE
Committed for sustainability

Sustainability

solarad.ai

Weather Data and Forecast for S olar Energy

Training and Placements

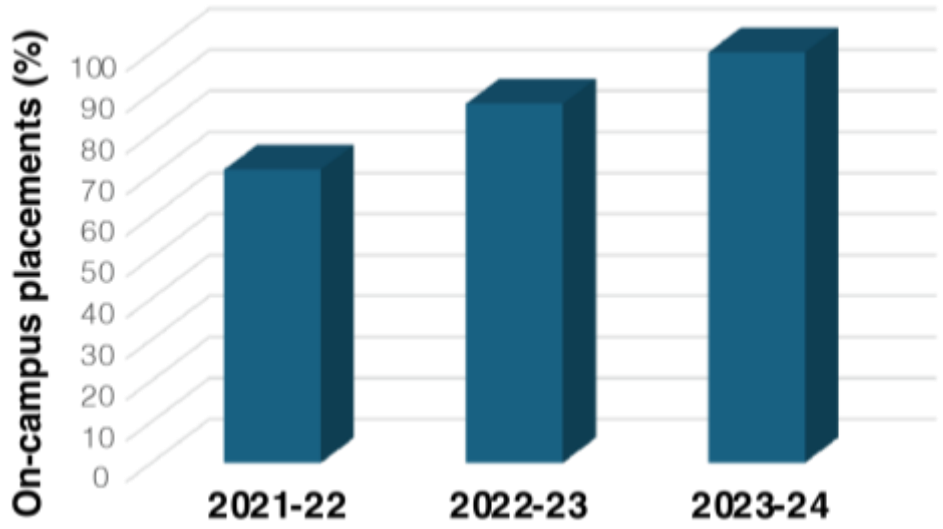
Phase 1
(December)

Phase 2
(January - July)

Placements

Pravritti
(Job / Internship Fair)

Off-campus vacancy advertisements



Training and Placements





Modern curriculum to meet future requirements

- ***Making graduates industry ready***
  - Introduction of experimental techniques and computational techniques as two different core courses
  - Introduction of a core course on 'Quality Management in Process Industries'
  - Introduction of summer internship and professional ethics courses

- ***Enhanced hands-on Learning***: Introduction of laboratory component in two core courses

- ***Fostering teamwork***: Introduction of cornerstone projects

- ***Emphasis on project-based learning***
  - Higher number of project core credits (26)

- ***Relevance to society***
  - Sustainability component included in the course 'Sustainable Process Engineering'
  - Environment aspects included in the course 'Advanced Chemical Reaction Engineering'

Overall credits structure

Non-project PC Credits	16
PE Credits	12
OE Credits	6
Project Core Credits	26
Total	60

Modern curriculum to meet future requirements

- ***Preparation for research-based careers and higher education***
  - Advanced courses (Advanced Transport Phenomenon, Advanced Chemical Reaction Engineering, Advanced Chemical Engineering Thermodynamics)

- ***Enhanced Flexibility***
  - Students can choose one out of three advanced courses in the program core category
  - Choice of doing a course-based program elective or mini project in 2nd semester
  - Higher number of open elective credits
  - Various new elective courses introduced

New courses

S. No.	Course code	Course title	Credits
1	CHL7001	Experimental Techniques for Chemical Engineers	(2-0-2) 3
2	CHL7002	Computational Techniques for Chemical Engineers	(2-0-2) 3
3	CHL7004	Quality Management in Process Industries	(3-0-0) 3
4	CHD7801	Cornerstone Project	(0-0-6) 3
5	CHT7803	Summer Internship	(0-0-6) 3
6	CHN7704	Teaching Practicum (NGU)	(0-0-8)
7	CHD7800	Mini Project	(0-0-6) 3
8	CHL7101	A Physicist's dive into Cell Biology	(3-0-0) 3
9	CHL7102	Drug Delivery for Chemical Engineers	(3-0-0) 3
10	CHL7201	Advanced Process Data Analytics	(3-0-0) 3
11	CHL7209	Particle based Simulation Techniques	(3-0-0) 3
12	CHL7210	Computational Process Design	(3-0-0) 3
13	CHL7301	Nanoscale Engineering	(3-0-0) 3
14	CHL7302	Novel Catalyst Design and High-throughput Screening	(3-0-0) 3
15	CHL7307	Nature Inspired Chemical Engineering	(3-0-0) 3
16	CHL7401	CCUS for Sustainable Industrial and Energy Systems	(3-0-0) 3
17	CHL7402	Engineering and Nature-Based Solutions to Mitigate Climate Change	(3-0-0) 3
18	CHL7404	Sustainable Polymer Science and Technology	(3-0-0) 3
19	CHL7409	Battery Management System and Modeling	(3-0-0) 3
20	CHL7410	Aerosol Science: Applied to Air Quality	(3-0-0) 3
21	CHL7502	Engineering of Soft Matter	(3-0-0) 3
22	CHL7505	Rheology of Complex Fluids	(3-0-0) 3
23	CHL7510	Microhydrodynamics and its Applications in Biological Systems	(3-0-0) 3
24	CHL7511	Introduction to Hydrodynamic Stability	(3-0-0) 3

Introduction of streamed electives

- Biopharmaceuticals and healthcare
- Multiscale Simulation and Data Analytics in Chemical Engineering
- Novel Materials and Reactor Engineering
- Sustainable Energy and Environment
- Complex Fluids and Interfacial Science

Streamed Electives: Biopharmaceuticals and Healthcare			
S. No.	**Course Code**	**Course Title**	**L-T-P**
1	CHL7101	A Physicist's dive into Cell Biology	(3-0-0) 3
2	CHL7102	Drug Delivery for Chemical Engineers	(3-0-0) 3
3	CHL7103	Molecular Biotechnology and in-vitro Diagnostics	(3-0-0) 3
4	CHL7104	Bioprocessing and Bioseparations	(3-0-0) 3
5	CHL7105	Structure, Transport and Reactions in BioNano Systems	(3-0-0) 3
6	CHL7106	Interfacial Behaviour and Transport of Biomolecules	(3-0-0) 3
7	CHL7107	Experimental Characterization of BioMacromolecules	(3-0-0) 3
8	CHL7510	Microhydrodynamics and its Applications in Biological Systems	(3-0-0) 3

Introduction of streamed electives

Streamed Electives: Multiscale Simulation and Data Analytics in Chemical Engineering			
S. No.	**Course Code**	**Course Title**	**L-T-P**
1	CHL7201	Advanced Process Data Analytics	(3-0-0) 3
2	CHL7202	Statistical Methods for Chemical Engineering	(3-0-0) 3
3	CHL7203	Applied Time Series Analysis for Chemical Engineering	(3-0-0) 3
4	CHL7204	Process Optimization	(3-0-0) 3
5	CHL7205	Evolutionary Optimization	(3-0-0) 3
6	CHL7206	Process Operations Scheduling	(3-0-0) 3
7	CHL7207	Fundamentals of Computational Fluid Dynamics	(2-0-2) 3
8	CHL7208	Applications of Computational Fluid Dynamics	(2-0-2) 3
9	CHL7209	Particle Based Simulation Techniques	(3-0-0) 3
10	CHL7210	Computational Process Design	(3-0-0) 3
11	CHL7211	Design of Multicomponent Separation Processes	(3-0-0) 3
12	CHL7212	Membrane Science and Engineering	(3-0-0) 3
13	CHL7213	Simulation Techniques for Complex Fluids	(3-0-0) 3
14	CHL7214	Molecular Modeling of Catalytic Reactions	(3-0-0) 3
15	CHL7215	Population Balance Modeling	(3-0-0) 3
16	CHL7216	Chemical Engineering Mathematics	(3-0-0) 3
17	CHL7217	Advanced Computational Techniques in Chemical Engineering	(2-0-2) 3
18	CHL7218	Advanced Process Control	(3-0-0) 3

Introduction of streamed electives

Streamed Electives: Novel Materials and Reactor Engineering			
S. No.	**Course Code**	**Course Title**	**L-T-P**
1	CHL7301	Nanoscale Engineering	(3-0-0) 3
2	CHL7302	Novel Catalyst Design and High-throughput Screening	(3-0-0) 3
3	CHL7303	Crystal Engineering and Design	(3-0-0) 3
4	CHL7304	Heterogeneous Catalysis and Catalytic Reactors	(3-0-0) 3
5	CHL7305	Process Intensification and Novel Reactors	(3-0-0) 3
6	CHL7306	Experimental Characterization of Multiphase Reactors	(3-0-0) 3
7	CHL7307	Nature-Inspired Chemical Engineering	(3-0-0) 3
8	CHL7308	Chemical Product and Process Integration	(3-0-0) 3
9	CHL7309	Chemical Product Development and Commercialization	(3-0-0) 3
10	CHL7310	Fine Chemicals Technology	(3-0-0) 3
11	CHL7311	Safety and Hazards in Process Industries	(3-0-0) 3
12	CHL7312	Materials of Construction	(3-0-0) 3
13	CHL7313	Polymerization Process Modeling	(3-0-0) 3
14	CHL7314	Structures and Properties of Polymers in Solutions	(3-0-0) 3
15	CHL7408	Electrochemical Conversion and Storage Devices	(3-0-0) 3

Introduction of streamed electives

Streamed Electives: Sustainable Energy and Environment			
S. No.	**Course Code**	**Course Title**	**L-T-P**
1	CHL7401	CCUS for Sustainable Industrial and Energy Systems	(3-0-0) 3
2	CHL7402	Engineering and Nature-Based Solutions to Mitigate Climate Change	(3-0-0) 3
3	CHL7403	Decarbonizing Fossil Fuel Sector	(3-0-0) 3
4	CHL7404	Sustainable Polymer Science and Technology	(3-0-0) 3
5	CHL7405	Principles of Electrochemical Engineering	(3-0-0) 3
6	CHL7406	Electrochemical Methods	(3-0-0) 3
7	CHL7407	Hydrogen, Electrolyser, and Fuel Cell Technology	(3-0-0) 3
8	CHL7408	Electrochemical Conversion and Storage Devices	(3-0-0) 3
9	CHL7409	Battery Management System and Modeling	(3-0-0) 3
10	CHL7410	Aerosol Science: Applied to Air Quality	(3-0-0) 3
11	CHL7411	Air Pollution Control Engineering	(3-0-0) 3
12	CHL7412	Environmental Engineering and Waste Management	(3-0-0) 3
13	CHL7413	Biomass Conversion and Utilization	(3-0-0) 3
14	CHL7414	Petroleum Reservoir Engineering	(3-0-0) 3
15	CHL7415	Petroleum Production Engineering	(3-0-0) 3
16	CHL7416	Petroleum Refinery Engineering	(3-0-0) 3
17	CHL7417	Natural Gas Processing	(3-0-0) 3
18	CHL7418	Petrochemicals Technology	(3-0-0) 3
19	CHL7419	Process Utilities and Pipeline Design	(3-0-0) 3

Introduction of streamed electives

Streamed Electives: Complex Fluids and Interfacial Science			
S. No.	**Course Code**	**Course Title**	**L-T-P**
1	CHL7501	Introduction to Complex Fluids	(3-0-0) 3
2	CHL7502	Engineering of Soft Matter	(3-0-0) 3
3	CHL7503	Colloids and Aerosols	(3-0-0) 3
4	CHL7504	Transport Phenomena in Complex Fluids	(3-0-0) 3
5	CHL7505	Rheology of Complex Fluids	(3-0-0) 3
6	CHL7506	Complex Fluids Technology	(3-0-0) 3
7	CHL7507	Interfacial Engineering	(3-0-0) 3
8	CHL7508	Fundamentals of Capillarity and Wetting	(3-0-0) 3
9	CHL7509	Introduction to Microfluidics and Microfabrication	(3-0-0) 3
10	CHL7510	Microhydrodynamics and its Applications in Biological Systems	(3-0-0) 3
11	CHL7511	Introduction to Hydrodynamic Stability	(3-0-0) 3
12	CHL7512	Granular Materials	(3-0-0) 3
13	CHL7513	Powder Processing and Technology	(3-0-0) 3