



Indian Institute of Science, Bangalore  
Department of Chemical Engineering

2021  
22

# Placement Brochure



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# About **IISc**

The Indian Institute of Science was founded by Jamshetji Nusserwanji Tata in 1909, to promote scientific temper and research aptitude in the nation. A focus on excellence in research, the academic freedom it offers, coupled with a beautiful campus and a salubrious climate has meant that the Institute is the most sought after destination for top researchers and young minds. The Institute has consistently been top in National Rankings and has made the nation proud by scoring high on many reputed international rankings. We endeavour to make the Institute a natural destination for companies that put a premium on intellectual capital.

## Recent **Rankings**

1<sup>st</sup>

NIRF(University)

2<sup>nd</sup>

NIRF(Overall)

1<sup>st</sup>

QS Research University  
Ranking

126-150<sup>th</sup>

Times Higher Education  
World Reputation Ranking

51<sup>st</sup>

QS University Ranking Asia

29<sup>th</sup>

Times Higher Education  
Asia Reputation Ranking





# About **DCE**



The Department of Chemical Engineering at IISc began as a centre for excellence in research and higher education in chemical engineering to address the needs of a phenomenally growing chemical industry in post-independence India. Established in 1943 as a wing of the Division of Pure and Applied Chemistry, it was bestowed the full status of a department in 1947. After its inclusion into the Engineering Faculty in 1961, it was renamed as the Department of Chemical Engineering.

The department has evolved significantly over the last seven decades, reflecting changes in the Indian chemical industry and the chemical engineering profession worldwide. Initial research in the fifties and sixties focused on thermodynamics, reaction kinetics, catalysis, and unit operations, and was followed in the seventies by chemical reactor theory. Design and development of catalysts for homogeneous and heterogeneous reactions and a variety of chemical reactors central to our industry were key contributions of the department at the time. In subsequent years, our department established itself at the forefront of research in multiphase systems. As newer areas like colloid and interfacial science, biochemical engineering, complex fluids, and polymer science emerged in the eighties, our department developed cutting edge research programs in these areas.



# Faculty



**Prabhu R Nott**  
*Professor*  
Ph.D., Princeton  
University



**Jayant M Modak**  
*Professor*  
Ph.D., Purdue University



**Sanjeev Kumar Gupta**  
*Professor and Chairman*  
Ph.D., Indian Institute  
of Science



**K Ganapathy Ayappa**  
*Professor*  
Ph.D., University of  
Minnesota



**V Kumaran**  
*Professor*  
Ph.D., Cornell  
University



**S Venugopal**  
*Associate Professor*  
Ph.D., Purdue  
University



**Narendra M Dixit**  
*Professor*  
Ph.D., University of  
Illinois, Urbana-Champaign



**Sudeep N Punathanam**  
*Professor*  
Ph.D., Purdue  
University



**Rahul Roy**  
*Associate Professor*  
Ph.D., University of  
Illinois, Urbana-Champaign



**Ananth Govind Rajan**  
*Assistant Professor*  
Ph.D., Massachusetts  
Institute of Technology



**Bhushan Toley**  
*Assistant Professor*  
Ph.D., University of  
Massachusetts Amherst



# Student Profiles



**Tatapudi Sandeep Kumar**

*MTech*  
Project: Inkjet Printing Catalysis



**Nishant Gupta**

*MTech*  
Project: Molecular Modelling of High Mach Number flows



**Armaan Rais**

*MTech (Research)*  
Project: Propane Dehydrogenation - Microkinetic Modelling



**Rohan Patel**

*MTech*  
Project: Calculation of contact angle for the oil-water-rock system using MD simulation.



**Nishchal Priyadarshi**

*MTech*  
Project: Artificial Intelligence Based Cell Identification for Diagnosis of Rare Disease



**Harshit Mittal**

*MTech*  
Project: Intensification of Transport Processes across solid liquid interfaces



**Anwin John**

*MTech*  
Project: Electro-catalytic reduction of Carbon dioxide to methane



**Harshvardhan Pande**

*MTech*  
Project: Paper Based Spirometry via. Fabrication of various paper based devices.



**Jatoth Vijay**

*MTech*  
Project: Parallel Paper-based toxin Detection using DNA Aptamer



**Kartikeya Aditya**

*MTech*  
Project: Understanding Gut Microbiome & microbial interactions.



# Skills

- Computational Transport Processes Modeling in Chemical Engineering
- DFT calculations
- Microkinetic Modelling
- Molecular Dynamic Simulation
- Monte-Carlo Simulations
- Numerical Optimization
- Parameter Estimation
- Population Balance Equation
- Process Intensification
- Process Modelling
- Reaction Engineering
- Statistical Thermodynamics

# Tools

## Software Package

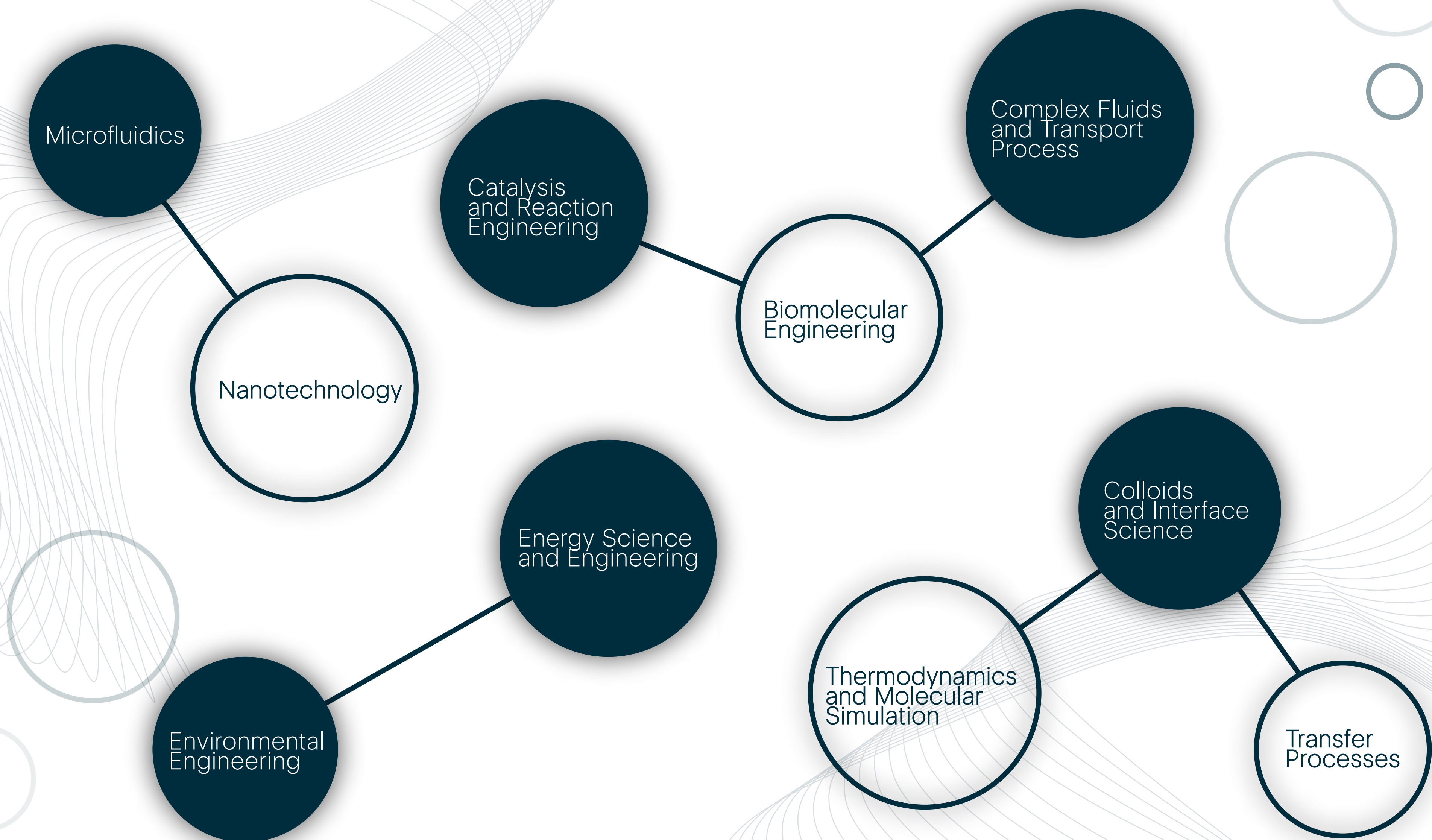


## Languages





# Areas of Research





# Curriculum

## M.Tech

The M. Tech program is a two-year course-based program designed to prepare students to address complex industrial and technological problems through an advanced knowledge of various chemical engineering subjects. A bachelor's degree in chemical engineering or a related field is necessary to enter the program. Selection is based on the score obtained in the GATE Chemical Engineering Paper. The program consists of 32 credits of course work and 32 credits of project work. Of the course credits, 21 credits are from compulsory core courses and the remaining from electives.

## M.Tech (Research)

Each student selects a research advisor and plans a program of course work and thesis research. A minimum of 12 credit hours of graduate course work is required. Students are required to take either CH 201 or CH 202. All students are required to take CH 206. Students are required to take two of the following three core courses: CH 203, CH 204, and CH 205. Independent research work is assessed through a general test midway into the program and a final Défense of the thesis

## Core Courses

CH 201 – Chemical Engineering Mathematics ,	CH 202 – Numerical Methods
CH 203 – Transport Processes,	CH 204 – Thermodynamics
CH 205 – Chemical Reaction Engineering	CH 206 – Seminar Course
CH 207 – Applied Statistics & Design of Experiments,	CH 299 – Dissertation Project

## Elective Courses

CH 232 – Physics of Fluids,	CH 250 – Laminar Flow
CH 235 – Modelling in Chemical Engineering,	CH 236 – Statistics Thermodynamics
CH 237 – Polymer Science and Engineering	CH 242 – Special Topics in Theoretical Biology
CH 243 – Mechanics in Particle Suspensions	CH 244 – Treatment of Drinking water
CH 245 – Interfacial and Colloidal Phenomena	CH 247 – Introduction to Molecular Simulation
CH 248 – Molecular Systems Biology	
CH 234 – Rheology of Complex Fluids and Particulate matter	





Laboratory for  
Nanobiology



Water Treatment and  
Granular Flow Lab



Laboratory  
for nanoparticle  
Engineering



Laboratory for Computational  
Nanotechnology for  
Energy and Water



Therapeutic  
Engineering Lab



Laboratory for Ubiquitous  
Medical Diagnostic  
Technology



Soft Interface  
Laboratory

# Labs & Facilities



# Recent News

## **IISc team inches closer to cracking the test**

A team of researchers from the Indian Institute of Science is among the 219 teams selected for the semi-final round of \$1 -million XPRIZE Rapid Covid Testing competition. The team named Ubiquitous Diagnostics, led by Dr Bhushan J Toley, assistant professor, Department of Chemical Engineering IISc has developed a PCR-free SARS-CoV-2 RNA detection test, which has been shortlisted for the semi-final round of the XPRIZE Rapid Covid Testing competition



## **IISc researchers find cholesterol helps bacterial toxins kill cells**

Researchers at the Indian Institute of Science (IISc), Bengaluru, have found that cholesterol present in cell membrane plays a crucial role in stabilising and binding together the pore-forming toxin cytolysin A. The pore-forming toxins form the largest class of bacterial proteins causing virulence that kills human cells. The cytolysin A toxin is secreted by E. coli, Shigella and Salmonella.



Prof. Sandya Visweswariah, Prof. K Ganapathy Ayappa, Amit Behera  
Prof. Rahulroy, Pradeep Sathyanarayana, Satya Ghosh

## **\$100,000 grant from Gates Foundation (2017)**

Funds will help Bhushan Toley develop technology that could improve diagnosis of infectious diseases. An assistant professor of the Indian Institute of Science (IISc) has won a Grand Challenges Exploration grant of \$100,000, funded by Bill and Melinda Gates Foundation.



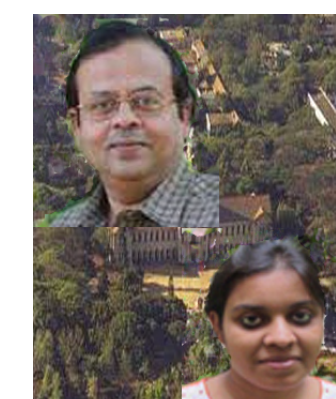
## **A new combination of drugs for combating hepatitis C (2017)**

Drugs that prevent entry of the Hepatitis C virus (HCV) into the host cells are equally effective as other drugs, finds a new study from the Indian Institute of Science (IISc), Bengaluru, published recently in the Proceedings of the National Academy of Sciences (The Hindu).



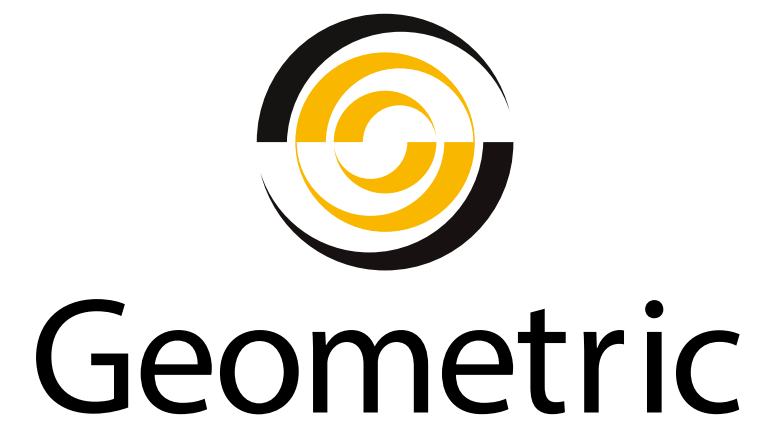
## **Cheaper, more plentiful light could clean lakes (2016)**

A visible light that is more cost- and energy-efficient than UV light can be used to disinfect water on a large scale, according to the new research conducted by Indian Institute of Science. Currently a lab-experiment, the team plans to scale it up for field-level work (Indian Express).





# Our **Alumni** Works at





# Contact Us

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## Faculty Coordinator

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For Placement Process Details  
<https://occap.iisc.ac.in>