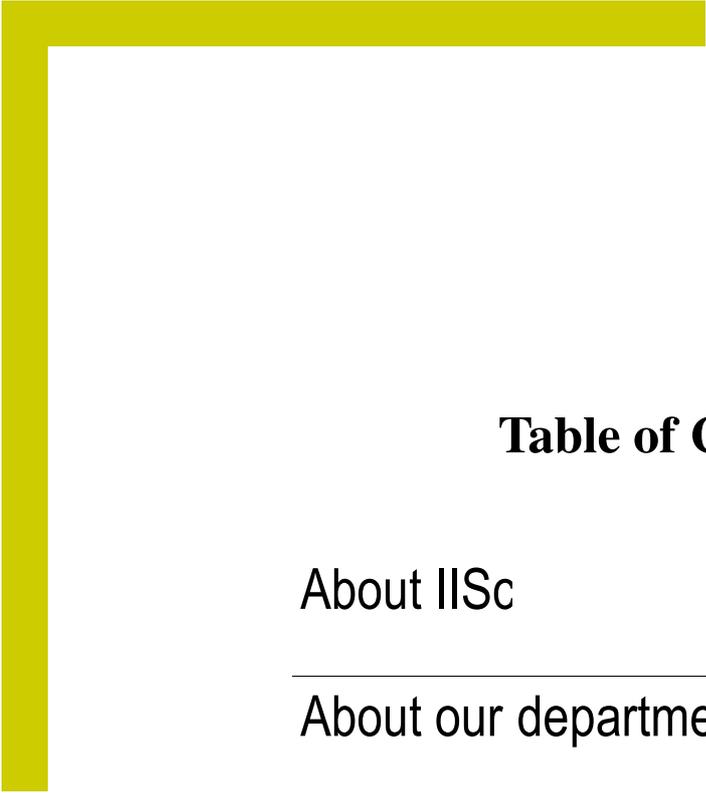




# Placement Brochure 2013-14

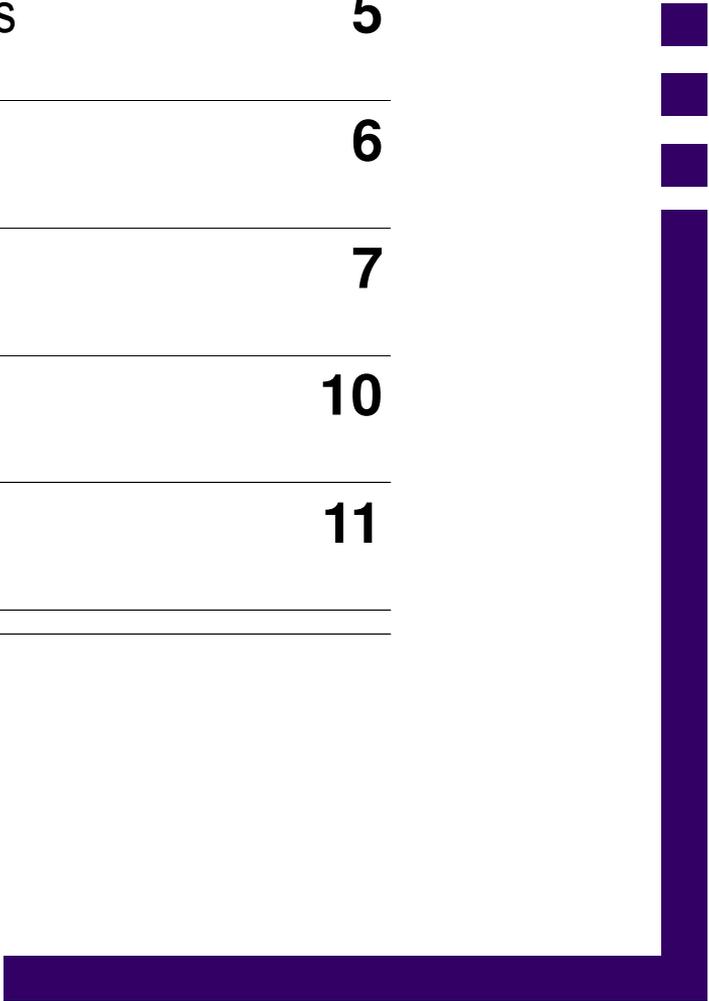


**Chemical Engineering**  
**Indian Institute of Science**  
Bangalore



## Table of Contents

About IISc	<b>3</b>
<hr/>	
About our department	<b>4</b>
<hr/>	
Academic programs	<b>5</b>
<hr/>	
Courses	<b>6</b>
<hr/>	
Research areas	<b>7</b>
<hr/>	
Past recruiters	<b>10</b>
<hr/>	
Contact us	<b>11</b>
<hr/>	
<hr/>	



## About IISc

*Jamsetji Nusserwanji Tata (1839-1903) was one of those visionaries who was convinced, even as early as the end of nineteenth century, that the future progress of this country depended crucially on research in Science and Engineering. He created an endowment in 1898 to establish a University of Science for educating and developing the faculties of the best of our young men and women. He envisaged this university as destined to promote original investigations in all branches of learning and to utilize them for the benefit of India.*

*It was Lord Ramsay, Nobel Laureate and discoverer of the noble gases, who was deputed by the Royal Society of England to study the proposal for a University made by Jamsetji and after a quick tour of our country chose Bangalore as a suitable place for this Institution.*

*His Highness Shri Krishnaraja Wodeyar-IV, the Maharaja of Mysore, came forward with an offer of 372 acres of land, free of cost, in Bangalore and promised other necessary facilities.*

*The detailed report that emerged from various committees appointed to study the constitution of this university recommended that the Institute be devoted to experimental science with emphasis on training students in experimental methods and carrying out original research .*

*Set up in 1909, the Institute has not only fulfilled the expectations of the visionaries but continues to be a leader in frontier research and training in science and technology in the country. **Recently, it became the only Indian institute to feature in Global Employability Rankings (2012) and stood at the 35<sup>th</sup> place among the universities across the world.***

## About our department

*The Department of Chemical Engineering at the Indian Institute of Science was started in 1943 as a wing of the Division of Pure and Applied Chemistry and acquired independent status in 1947. The department has a longstanding history of excellence in research and postgraduate education.*

*The department bears the hallmark of quality, both in terms of the academic curriculum and the standard of students. The courses offered are not only rich in content but also enhance the understanding and analytical skills of the students by a regular process of evaluation. The curriculum also aims to improve the communication skills of students who are given the opportunity of attending and delivering talks on current topics in technology and science.*

*Most of the students who reach here come from eminent institutes like IITs, NITs and BITS. Moreover, they have in most cases been the top rankers in their undergraduate programs. The fierce competition to secure a seat at IISC is reflected in the fact that most of the students selected through GATE have All India ranks within the top 50.*

# Academic programs

## Master of Engineering (ME)

*The ME 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.*

## Master of Science (MSc [Engg.])

*The Master of Science program is a research based program designed to prepare students to advance chemical engineering through research, development, production, design and/or management. A bachelor's degree in engineering or a master's degree in sciences with mathematics as a subject at least at the bachelor's level is required to enter the program.*

## PhD

*The Doctor of Philosophy program is designed to prepare each student to actively participate in the development and growth of the field of chemical engineering at all levels in the industry or in research and teaching in a university or a research organization. Students can enter the PhD program either with a master's or a bachelor's degree in engineering.*

***No of students opting for placements this year:***

<b><i>ME : 10</i></b>	<b><i>MSc[Engg] :1</i></b>	<b><i>PhD :1</i></b>	<b><i>Total :12</i></b>
-----------------------	----------------------------	----------------------	-------------------------

# Courses

## Core:

*Chemical Engineering Mathematics*  
*Numerical Methods*  
*Chemical Reaction Engineering*  
*Thermodynamics*  
*Transport Processes*

## Electives:

*Advanced Process Control*  
*Computational Transport Process*  
*Mechanics of Granular Materials*  
*Physics of Fluids*  
*Modeling in Chemical Engineering*  
*Modern Instrumental Methods of Analysis*  
*Polymer Science and Engineering*  
*Special Topics in Theoretical Biology*  
*Statistical Thermodynamics*  
*Treatment of Drinking Water*  
*Molecular Systems Biology*  
*Introduction to Molecular Simulation*

## Computer skills:

*Language: C, C++ and FORTRAN*  
*Software package: COMSOL, MATLAB,*  
*MATHEMATICA, Material Studio, LAAMPS*  
*and GROMACS. \**

*\*Apart from this students write their own codes for finite volume methods, Monte-Carlo simulations, Lattice-Boltzmann simulations, population balance equations, and optimization.*

# Research areas

## ***Biochemical Engineering and Polymer Science***

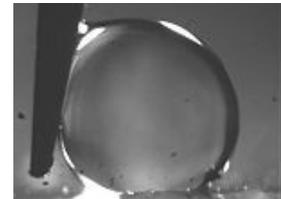
*Transport and kinetic modelling of multiphase bioprocesses; kinetics of enzymatic reactions in supercritical fluids; metabolic control and sensitivity analysis of bioreactors; optimization and control of fermentation processes using genetic algorithms; bioleaching of sulphides; bioleaching of ocean nodules, synthesis and ultraviolet and ultrasonic degradation of polymers, modeling of evolution of molecular weight distributions, single molecule imaging and biophysics and RNA-Protein interactions.*



» Prof.M Giridhar, Prof. J M Modak, Prof. Rahul Roy

## ***Colloidal and Interfacial Science***

*Formation of nanoparticles in micelles; stability of emulsions; liquid-liquid dispersions, modeling of foam flow, recovery of particulate matter using dispersions; crystallization, ostwald ripening, solubilization in surfactant solutions.*



» Prof.K G Ayappa, Prof. M Giridhar, Prof.S K Gupta, Prof.S Venugopal, Prof.P Sudeep

## ***Complex fluids***

*Analysis of slow granular flows; flow of powders in bins, channels and hoppers; vibrofluidized beds; fluid mechanics of suspensions; rheology of liquid crystalline materials; hydrodynamic stability of flows on flexible surfaces.*



» Prof.K G Ayappa, Prof..K K Rao, Prof.V Kumaran, Prof.P R Nott, Prof. S K Gupta

# Research areas

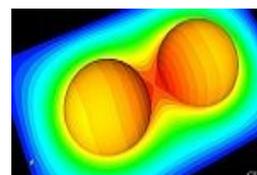
## ***Environmental Engineering***

*Polymer recycling; synthesis of biodegradable polymers; remediation of contaminated soils with supercritical fluids; biosorption of heavy metals; solid waste management; water and waste water management; defluoridation of drinking water.*

» Prof.M Giridhar, Prof.K K Rao, Dr. J R Mudakav

## ***Modeling and Simulation***

*Molecular dynamics and Monte Carlo simulation of confined fluids and interfaces; simulation of self assembling systems; modeling of nanoparticle formation; modeling of a randomly packed bed of spheres; identification and simulation of distributed process systems; CFD modeling of dryers and centrifugal extractors; reactive mixing in turbulent flows; modeling of viral dynamics and drug therapy; simulations of evolution of viral diversity; modeling of supercapacitors and batteries;*



» Prof.K G Ayappa, Prof.R Kumar, Prof.V Kumaran, Prof.N M Dixit, Prof.P R Nott, Prof.S K Gupta, Prof.P Sudeep

## ***Nanotechnology***

*Functional nanoscale architectures; synthesis of metal nanoparticles; semiconductor nanowires; guided self-assembly to form 2D and 3D superlattices, Super- Resolution Microscopy.*



» Prof. K G Ayappa, Prof. S K Gupta, Prof. S Venugopal, Prof. P Sudeep, Prof. Rahul Roy

## ***Reaction Engineering***

*Transport processes and reactions in packed beds; polymer synthesis and degradation reactions in supercritical fluids; kinetics of reactions mediated by ultrasound and microwave; sintering reactions using microwaves; multiphase sonochemical reactors.*

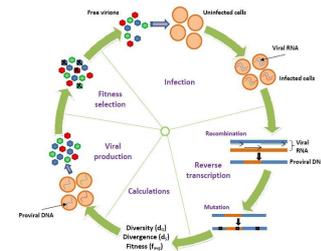
» Prof.K G Ayappa, Prof.M Giridhar, Prof.J M Modak, Prof.S K Gupta

# Research areas

## ***Theoretical biology***

*Modelling the dynamics of HIV and hepatitis C virus infections; simulation of viral evolution and diversity; drug pharmacokinetics and therapy optimization; biophysics of virus-cell interactions; theoretical descriptions of the immune response; leukocyte movement, homing, and inflammation.*

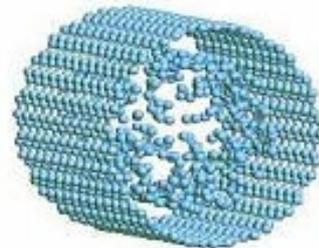
» Prof. N M Dixit



## ***Transfer Processes***

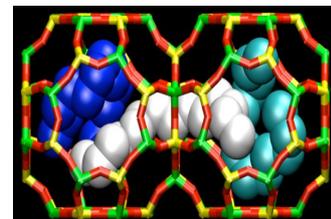
*Carrier mediated separations and extractions of amino acids and metals; transport processes in supported liquid membranes; multicomponent precipitation; solids suspension in bubble columns; voidage profiles, flow distribution, and mass dispersion in packed beds; microwaves heating and thawing; micro-channel reactors*

» Prof. K G Ayappa, Prof. M Giridhar, Prof. V Kumaran, Prof.S K Gupta



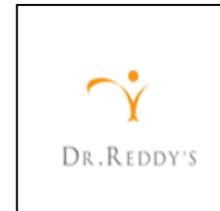
## ***Thermodynamics***

*Modelling thermodynamic behaviour of gas hydrates; Modelling solid-fluid phase equilibria in nanoparticle suspensions; Study of kinetics of nucleation process for vapour to liquid and fluid to solid phase transitions; Modelling and simulation of adsorption in microporous adsorbents under liquid phase conditions*



» Prof. K G Ayappa, Prof. M Giridhar, Prof. V Kumaran, Prof.S K Gupta

## Few of our recruiters



## Contact Us

*The Chairman*

*The Placement Centre*

*CSIC*

*Indian Institute of Science*

*Bangalore*

*Tel: 080 - 2293 2516, 2293 2477*

*Fax: 080 - 2331 4845*

*Email: [chairman@csic.iisc.ernet.in](mailto:chairman@csic.iisc.ernet.in)*

### *Faculty*

*Prof. Narendra M. Dixit*

*[narendra@chemeng.iisc.ernet.in](mailto:narendra@chemeng.iisc.ernet.in)*

### *Student Coordinators*

*[placement@chemeng.iisc.ernet.in](mailto:placement@chemeng.iisc.ernet.in), [placement.chemeng@gmail.com](mailto:placement.chemeng@gmail.com)*

*Kapil Newar*

*[+91-88615-50778]*

*Ankit*

*[+91-88615-39788]*

For further details visit: <http://chemeng.iisc.ernet.in>