Department at a Glance

The Department of Chemical Engineering at BITS-Pilani, Pilani Campus is one of the premier departments in the country that provides a unique educational and research environment. The broad vision of the Department of Chemical Engineering is to excel in teaching/learning, innovative research and industry engagement and to disseminate the same in order to become a world leader in chemical engineering and allied interdisciplinary areas. The primary mission of Department of Chemical Engineering is to enable the students to imbibe technical and analytical skills through the culture of logical and critical thinking. The other goal is to establish modern infrastructure and conducive research environment for carrying out academic and sponsored research.

Academic Programmes

B.E. Chemical Engineering

Students who are appearing for 12th or who have passed 12th Examination the very previous year only are eligible to appear in the BITS Admission Test (BITSAT). Admissions are carried out purely on merit basis. The merit position of the candidate for admission will be based on the score obtained by the candidate in BITSAT. However, their eligibility for admission is subject to fulfilling the requirement of minimum 75% PCM marks in 12th examination. For more details: please visit: http://www.bitsadmission.com/

M.E. Chemical Engineering

This higher degree programme of Che Dept entails salient features such as intensive research training under one-year dissertation option, rigorous industrial exposure under six-month practice school option, hands on experience in the state of the art analytical instrumentation and software facilities, unique research methodology training by the faculty members, thorough teaching training under experienced faculty members. Provision for vertical transfer to PhD Programme. There are two routes of admission in ME Chemical Engg program, one in through GATE and other is through HD test conducted by BITS. For more details: please visit:http://www.bitsadmission.com/

Doctor of Philosophy (Ph.D.)

The conventional, research-based doctoral degree programme provides a thorough grounding in the fundamental principles of Chemical Engineering, as well as an intensive research experience. Applications for Ph.D. programme are invited twice in a year and candidates are selected based on The merit. Applicants admitted to the Ph.D. programme may also be considered for Institute Assistantship up to Rs 25000 per month. This is in addition to fee waiver of 90%. The selected candidates will be required to participate in teaching and other developmental activities of the institute. For more details: please visit: http://www.bitsadmission.com/
Research Infrastructure

Departmental research activities reflect the interdisciplinary nature of modern Chemical Engineering. Research is organized in numerous themes that cover the contribution to grand challenges in the arena of Chemical Engineering. Department is in sync today’s trend with state-of-the-art facilities in terms of having best of analytical facilities to carry out good research work and best of computational facilities. Listed below are some department research laboratory equipment which are well equipped with state-of-the-art facilities:

<table>
<thead>
<tr>
<th>Laboratories</th>
<th>Major Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical</td>
<td>Atomic Absorption Spectrophotometer (AAS), Gas Chromatograph (GC), Fourier Trans-</td>
</tr>
<tr>
<td></td>
<td>form Infrared Spectrophotometer (FTIR), Differential Scanning Calorimeter (DSC),</td>
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<tr>
<td></td>
<td>Thermo Gravimetric Analyzer (TGA), High Performance Liquid Chromatography (HPLC),</td>
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<tr>
<td></td>
<td>BET Surface Area Analyzer UV/VIS Spectrophotometer, etc.</td>
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<tr>
<td>Computer Aid-</td>
<td>ASPEN, ANSYS FLUENT 14.0, gPROMS, etc</td>
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<td>ed Design</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>Biofilter Column Set-up, Biomass Gasifier Set-up, Pyrolysis Unit, Reactive Distil-</td>
</tr>
<tr>
<td></td>
<td>lation Set-up, Continuous Adsorption Set-up, Air-Lift Bioreactor, CSTR Unit, Fluid-</td>
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<tr>
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<td>ized Bed Pyrolysis Unit, Fixed Bed Reactor, etc</td>
</tr>
<tr>
<td>Environmental</td>
<td>BOD Incubator Shaker, Temp. Controlled Shaker Bath, Laminar Hood Chamber, Stack</td>
</tr>
<tr>
<td>Engineering</td>
<td>Sampler, Orsat Appratus, Refractometer, Water-Analysis Kit, Ultrasonic Cleaner,</td>
</tr>
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<td></td>
<td>Autoclave, Ultra-pure Water Purification System, Syringe Pump, Ion meter, High speed centrifuge, etc.</td>
</tr>
<tr>
<td>Petroleum &amp;</td>
<td>Redwood, Saybolt &amp; Engler Viscometer, Penetrometer Apparatus, Bomb Calorimeter,</td>
</tr>
<tr>
<td>Petrochemical</td>
<td>Melting Point &amp; Smoke Point Apparatus, Oxidation Stability Tester, Sulfur Analyzer,</td>
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<tr>
<td></td>
<td>ASTM Distillation, Flash Point and Fire Point, Cloud Point and Pour Point, Reid Vapor</td>
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<td></td>
<td>Pressure, Conradson Carbon Residue, Hydrometers and Pycnometers, etc.</td>
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<tr>
<td>Teaching</td>
<td>Approximately 90 UG Experimental Setups Covering Process Control, Heat Transfer,</td>
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<tr>
<td></td>
<td>Mass Transfer, Fluid Mechanics, Reaction Engineering, Mechanical Operations, Engineer-</td>
</tr>
<tr>
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<td>ing Chemistry Laboratories.</td>
</tr>
</tbody>
</table>
Dr Arvind Kumar Sharma
Associate Professor

Presently Dr Sharma is an Associate Professor in the Department of Chemical Engineering at Birla Institute of Technology and Science (BITS) Pilani – Pilani Campus. Dr Sharma obtained his PhD from IIT Madras. His research, broadly, includes Environmental Engineering (Water and Wastewater Treatment), Adsorption, Fluidization, Hydrodynamics, Biochemical Engineering (Bioreactor Analysis and Design), Reaction Mechanism & Kinetics and Modeling & Simulation. Prof. A K Sharma is also nurturing his interests in Reactor Analysis & Design, Computational Fluid Dynamics and Statistical Thermodynamics. He is guiding 1 PhD and has guided 1 PhD, 7 ME Dissertations students.

SELECTED PUBLICATIONS:


Dr Hare Krishna Mohanta
Associate Professor and HoD

Dr. Hare Krishna Mohanta received his PhD in Chemical Engineering from BITS Pilani, MTech and B.E. Degrees in Chemical Engineering from IIT Kanpur and NIT Rourkela, respectively. He worked for around one year in Indian Rare Earths Limited (A division of Department of Atomic Energy, Govt. of India) prior to joining for his Master’s Degree in IIT Kanpur. His research group’s focus is Modelling, Simulation and Control of Chemical Processes; Design of Soft Sensors for Monitoring and Control of Industrial Processes. Prof Mohanta’s recent interest also include application of ancient Vedic techniques for Sustainable Development of the Society.

SELECTED PUBLICATIONS:


Dr Suresh Gupta
Associate Professor

Dr Suresh Gupta is an Associate Professor in the Department of Chemical Engineering, BITS-Pilani, Pilani campus, Rajasthan, India. He completed his PhD from BITS-Pilani, Pilani campus. He has 15 years of Teaching and Research experience. Dr Gupta’s research interests include Environmental Engineering and Separation Processes, Bioleaching of metal ion from industrial waste, Mathematical Modeling of Chemical Processes, and Energy Integration. Prof Gupta has around 35 research publications in peer reviewed journals. He has around 60 conference proceedings and 7 book chapters to his credit. He has guided 3 PhD students and currently guiding 3 students as supervisor or co-supervisor. He has guided 11 M.E. Dissertation students. He has completed 4 research and sponsored projects from UGC, DST and BITS-Pilani.

SELECTED PUBLICATIONS:


Dr Pradipta Chattopadhyay
Assistant Professor

Dr. Pradipta Chattopadhyay joined the Chemical Engineering Department, BITS Pilani, Pilani Campus in August, 2009 as Assistant Professor. After completing B.E., Chemical Engineering at Jadavpur University, India in 2000, he obtained M.S. from Texas A&M University-Kingsville, U.S.A. (2002) and Ph.D., Chemical Engineering from University of Tulsa, U.S.A. (2006). He has more than 8 years work experience as Assistant Professor in Chemical Engineering Department, BITS Pilani, Pilani campus.

Research of Dr. Chattopadhyay is focused on surfactant synthesis, surfactant foam characterization and applications. Several studies on surfactant generated aqueous foam characterization highlight the importance of foam development for formulation of dishwashing detergents, soaps and shampoo. Aqueous foam property evaluations, that are being performed as part of the research, are useful for better understanding of foam behavior suited and targeted for formulation of detergents and environmental remediation applications. Currently, there is an urgent need to further improve the capabilities of existing surfactants and synthesize better novel surfactants. The surfactant characterizations including the assessment of quality of generated foam development has tremendous significance for environmental remediation applications as well as personal care products industry.

SELECTED PUBLICATIONS:

Dr Pratik N Sheth
Assistant Professor

Dr Sheth is carrying out the experimental and theoretical studies on the thermo-chemical conversion techniques i.e. pyrolysis and gasification to convert biomass into bio-oil/producer gas. The biomass used in the studies include wood waste, jatropha residue cake and pre-treated biomass pellets. The focus is also to enrich the producer gas with hydrogen using steam gasification and also by catalytic conditioning of gas produced post gasification. Dr Sheth has recently started working on the CFD analysis of the biomass cook stove. Dr Sheth has completed 3 funded research projects and currently one research project is ongoing. Dr Sheth has guided 11 ME Dissertation students and many BE project students. Currently two PhD students are working under his supervision. He has to his credit 9 international journal publications and 3 national journal publications.

SELECTED PUBLICATIONS:

Dr Smita Raghuvanshi
Assistant Professor

Dr. Smita Raghuvanshi is working as an Assistant professor in Department of Chemical Engineering, BITS-Pilani, Pilani campus, Rajasthan, India. She did her PhD from BITS-Pilani, Pilani campus and having 13 years of teaching and 10 years of research experience. She is having a vast expertise in Environmental Engineering & Separation Process (bio-filtration for removal of VOCs and metals; CO₂ mitigation using bio-based techniques; design of bioreactor); kinetic modeling of bio-degradation & bio-filtration processes and Environmental Management systems (Environmental impact assessment of various processes and life cycle assessment of industrial processes). She has around 20 research publications in peer reviewed International Journals. She has guided 2 PhD students as supervisor or co-supervisor. She has also guided 5 ME dissertation students and is also actively involved in the projects of Undergraduate students.

SELECTED PUBLICATIONS:
Dr Banasri Roy
Assistant Professor

She is PhD in Materials Engineering from Colorado School of Mines, Colorado and National Renewable Energy Laboratory (NREL), Golden, Colorado, USA. M. Tech in Materials Engineering from IIT-Kanpur. She is working on nano catalyst systems for H₂ production from ethanol and biomasses. The aim is to develop efficient catalytic systems and apply energy efficient processes (APR, LTSR, etc.) to lower the cost of H₂ production at least by a factor of 3-4 and improve production rate. Her research interest also includes surface modification of metal, alloy, polymer, ceramics, and composites to improve biocompatibility by providing the proper chemical properties and morphological structure to adhere the cell/tissue. At the same time administrating enough physical strength to the coating to sustain the tissue growth and proliferations.

SELECTED PUBLICATIONS:


Dr. Srinivas Appari
Assistant Professor

His primary research focus is on the development of heterogeneous catalysts for hydrogen production from renewable fuel sources. He emphasizes on multiscale modeling of chemically reacting flows coupled with detailed kinetics (gas/surface kinetics) for predicting the product selectivity on time-on-stream, and associated catalyst deactivation/poisoning phenomena. We perform the catalytic activity experiments and modeling the reactors for validating the detailed kinetics.

Another area of his research includes catalyst development and production of top value-added chemicals such as aromatics and transportation fuels from fast pyrolysis of solid waste. Other catalytic research is CO₂ conversion and development of multifunctional catalysts based on first principles approach (DFT).

SELECTED PUBLICATIONS:


Dr Ajaya Kumar Pani
Assistant Professor

Dr. Pani obtained PhD from BITS, Pilani. He received Bachelor of Engineering from National Institute of Technology, Rourkela and Master of Technology from Indian Institute of Technology, Banaras Hindu University, Varanasi.

Research Area: Improved instrumentation and data storage facility in modern process industries have resulted in access to huge amount of plant data. Dr Pani's research work involves utilization of these available plant data for improved process performance. His broad research area is application of multivariate statistics and soft computing techniques for data-driven quality monitoring, process monitoring and fault detection in chemical industries. Besides this, his research area also includes design of PID and model predictive control systems for better closed loop performance.

SELECTED PUBLICATIONS:

Dr. Amit Jain
Assistant Professor

Dr. Amit Jain is Assistant Professor in Department of Chemical Engineering, BITS Pilani - Pilani Campus, Pilani. His past positions include Lecturer, BITS Pilani - Pilani Campus; Lecturer, Institute of Technology, Nirma University, Ahmedabad. He has rich experience of 14 years in teaching, research and administration. He Pursued Ph.D. from BITS Pilani - Pilani Campus. He has several publications in peer-reviewed journals and conferences. His research interests include: Decentralized multiloop control of Chemical processes/Bioreactors; Bioremediation of hydrocarbon waste and simultaneous production of biosurfactants; Design and development of pool fire suppressants.

SELECTED PUBLICATIONS:


Dr Priya C Sande
Assistant Professor

Dr Priya completed her BE from VTU, Bangalore and ME followed by PhD from BITS Pilani, Pilani campus. She has been serving with full fledged teaching and research responsibilities at BITS Pilani, Pilani campus, since 2009. Her research work includes, use of CFD Eulerian-Eulerian modeling and simulation to explore fluidized bed regimes; with specific reference to improve the Fluidized Catalytic Cracking process. Fluidized Geldart A particles are of major interest since they uniquely experience ‘Homogeneous expansion’ before bubbling. Simulation studies on the same were the topic of her PhD work. She hopes to continue with experimental work as well by exploring the turbulent regime using a recirculating type apparatus. Detailed description of flow field as well as particulate structures has great significance in processes like Fluidized Catalytic Cracking. Investigation using imaging tools like Particulate Imaging Velocimetry (PIV) is part of the future work.

SELECTED PUBLICATIONS:

Dr. Krishna C. Etika
Assistant Professor

Dr. Krishna C. Etika received his Ph.D. in Materials Science and Engineering from Texas A&M University, College Station, Texas. After Ph.D., Dr Etika worked as a R&D Process Engineer with Intel Corporation in U.S.A. where he supported pathfinding and technology development activities for the next generation VLSI chip manufacturing. He also held appointments with IIT Madras and Vignan’s (Deemed to be) University, Guntur prior to joining BITS Pilani as a faculty member in Chemical Engineering.

SELECTED PUBLICATIONS:


CHEMICAL ENGINEERING ASSOCIATION:
The Chemical Engineering Association organizes various activities starting from APOGEE-a major technical event of BITS Pilani. The Association regularly collects data from the final year students about their summer internships, placements and shares the same with current 3rd year students. It also helps the Department in organizing various invited talks, workshops conducted by esteemed academicians, industry experts every semester. The Association also conducts Farewell for B.E. and M.E. final year students towards the end of the semester. It assists the Department during the interviews typically held during the month of April for the various Academic awards.

The Department also has a student chapter of Indian Institute of Chemical Engineers (IICChE), under IICChE Pilani Regional Centre. IICChE Pilani Regional Centre is also engaged in conducting various workshops & guest lectures.

A few PS Stations:
1. Tata chemicals, Babrala
2. CLRI, Chennai
3. DRL, Hyderabad
4. IICT, Hyd
5. ABSTC, Mumbai
6. Grasim Industries, Nagda
7. IIP, Dehradun & Many more…..

Selected Campus Recruiters:
1. Schlumberger Asia Services Ltd.
2. Shell Global Solutions
3. IOCL
4. RANBAXY Laboratories limited
5. Deloitte Consulting India Private Limited
6. Larsen & Tubro Pvt Ltd
7. SRF Ltd
8. Saint Gobain Ltd, Many more…..
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