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.

Vision of the department

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.

Mission of the department

- To impart quality education and training in chemical engineering and associated fields to enable the students to imbibe technical and analytical skills through the culture of logical and critical thinking.
- To inculcate sense of social and environmental responsibility among students which inspires them to apply chemical engineering principles in solving industrial problems through sustainable and eco-friendly technologies for the betterment of industry and nation.
- To establish modern infrastructure and conducive research environment for carrying out academic and sponsored research.
- To foster spirit of excellence and professional leadership in students and faculty members through exposure to leading academic institutions, research organizations and external experts.
- To generate suitable opportunities for sustained interaction and collaboration with academia and industry.

Head of the department message

Established in 1964, the Chemical Engineering Department of BITS Pilani, Pilani campus surpassed more than 56 years. We are in a mature state where main areas of academics; teaching, research, and industrial engagement, are explored and developed. The expertise of the young dynamic faculty members, hand-picked from the renowned and prime institutes, span the whole spectrum of the multidisciplinary nature of the Chemical Engineering and aligned subjects. Here students, are exposed to a high standard teaching quality, state of the art research endeavor, and world class industrial applications.

Our aim is to inculcate the social and environmental responsibility and wellbeing in the young minds while we train the students to be future leaders in industries and academics. Chemical Engineering Department has been ranked in the top 351-400 by QS World University Subject Rankings 2020 and in top 14 in India. We are thriving to excel more day to day. We invite and encourage the enthusiastic hard working students, with strong technical background, proper analytical skills, and logical and critical thinking, to be part of our legacy and pursue doctoral degree; either via full-time program or part-time program. For the full-time students we provide modern infrastructure, conducive research environment, and suitable guidance. Part-time program involves working professionals passionate to learn, grow, and interested in enhancing career opportunities. Together we can build the future.

Dr. Banasri Roy
Academic Programmes

B.E. Chemical Engineering

Admission is purely merit basis, according to the score obtained in BITS Admission Test (BITSAT). Students, who are appearing for 12th or have passed 12th Examination the very previous year only are eligible to appear in the BITSAT. Additionally, students must fulfill the requirement of minimum 75% PCM marks in 12th examination. There are approximately 90 Experimental Setups, Covering Process Control, Heat Transfer, Mass Transfer, Fluid Mechanics, Reaction Engineering, Mechanical Operations, Engineering Chemistry, etc., as a part of the departmental undergraduate teaching curriculum.

For more details: [http://www.bitsadmission.com/](http://www.bitsadmission.com/)

M.E. Chemical Engineering

There are two routes of admission; one in through GATE and other is through HD test. This higher degree program of department is research centric and prepares the students for a productive research/professional career. This degree provides 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, and thorough teaching training under experienced faculty members. There is a Provision for vertical transfer from ME to PhD Program.

For more details: [http://www.bitsadmission.com/](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, inter-disciplines, and related areas, as well as an intensive research experience. There are two types of Ph.D. options as follows:

Full-time program: For the individuals who would like to pursue Ph.D. in-house, residing on campus. These students are eligible to be considered for a monthly Institute fellowship of Rs. 28,000 or Rs. 31,000 (based on qualification) at the time of admission. The selected candidates will be required to participate in teaching and other developmental activities of the institute.

Part-time program: For working professionals to provide basic facilities and environment for research. Applications for Ph.D. programme are invited twice in a year and candidates are selected based on the merit.

For more details: [http://www.bitsadmission.com/](http://www.bitsadmission.com/)

WILP (Work Integrated Learning Program)

It is a continuing technical education programs designed to create a smarter future ready workforce for the organizations. Since 1979, WILP has helped corporate leaders to connect their learning investments with their business. Additionally, this program significantly contributes toward productivity enhancement, employee retention and succession planning in organizations. There are more than 30 programmes, 90 corporate partners, and 1000 faculty members connected in this program, while 20000 working professional are enrolled currently and 70000 working professional graduated out so far.

For more details: [https://bits-pilani-wilp.ac.in/programmes-for-organisation.php](https://bits-pilani-wilp.ac.in/programmes-for-organisation.php)
Research Areas

- Catalysis
- Energy Engineering
- Computational Transport Phenomena
- Material Science & Polymer Engineering
- Petroleum Engineering
- Biochemical Engineering
- Environmental Science & Engineering
- Process Systems & Controls Engineering

List of ongoing research projects:

- Dr. Somak Chatterjee, Dr. K. C. Etika, Design and development of inline sensor for water contamination detection - INR 26.67 Lakhs, 2020 - 2022 - Industry (A renowned water filter manufacturer in USA).
- Dr. Pradipta Chattopadhyay, Understanding emulsion kinetics of surfactants, 7.9 Lakhs, Sept. 2020 – Aug. 2022 - Industry (Total Oil India Pvt Ltd.).
- Prof. Smita Raghuvanshi, Process development for Bio-Mitigation of Flue Gases (CO2, SOx and NOx) using chemolithotrophs and production of value-added products - INR 31.61 Lakhs, 2019 - 2022, CRG, SERB - DST.
- Dr. B.V. Reddy K., Assessment of Mixed-Matrix membrane system for CO₂ separation for upgradation of Biogas to Bio-Compressed Natural Gas (Bio-CNG) - INR 24.47 Lakhs, 2019 - 2021, SRG, SERB - DST.

A detailed overview of research projects funded by the institute as well as external grants from industry and several government funding agencies are listed in the following link:

https://www.bits-pilani.ac.in/pilani/chemicalengineering/SponsoredResearchProjects
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.

Research Facilities

<table>
<thead>
<tr>
<th>Analytical</th>
<th>List of our state of the art facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Absorption Spectrophotometer (AAS)</td>
<td>Air-Lift Bioreactor</td>
</tr>
<tr>
<td>Online Gas Chromatograph (GC)</td>
<td>Fluidized Bed Pyrolysis Unit</td>
</tr>
<tr>
<td>Fourier Transform Infrared Spectrophotometer (FTIR)</td>
<td>Biofilter Reactor</td>
</tr>
<tr>
<td>Differential Scanning Calorimeter (DSC)</td>
<td>Biomass Gasifier</td>
</tr>
<tr>
<td>Thermo Gravimetric Analyzer (TGA)</td>
<td>Pyrolysis Unit</td>
</tr>
<tr>
<td>High Performance Liquid Chromatography (HPLC)</td>
<td>Continuous Adsorption</td>
</tr>
<tr>
<td>BET Surface Area Analyzer</td>
<td>Catalyst Fixed Bed Reactor</td>
</tr>
<tr>
<td>UV/ VIS Spectrophotometer</td>
<td>Low-temperature Steam reforming reactor</td>
</tr>
<tr>
<td>High Speed Photography &amp; Imaging Devices</td>
<td>High Pressure Hydrothermal Reactors</td>
</tr>
<tr>
<td>X-Ray Diffraction (XRD)</td>
<td>Fermenter</td>
</tr>
<tr>
<td>Field Emission Scanning Electron Microscope (FESEM-EDX)</td>
<td>High Speed Photography and Imaging devices</td>
</tr>
<tr>
<td>Atomic Force Microscope (AFM)</td>
<td>PIV</td>
</tr>
<tr>
<td>Pyrolysis Gas Chromatography (Py-GC-MS/MS)</td>
<td>Reactive Distillation Column</td>
</tr>
<tr>
<td>XPS (X-Ray Photoelectron Spectroscopy)</td>
<td>Saybolt &amp; Engler Viscometer</td>
</tr>
<tr>
<td>Nuclear Magnetic Resonance (NMR)</td>
<td>Penetrometer Apparatus</td>
</tr>
<tr>
<td>Raman Spectroscopy</td>
<td>Bomb Calorimeter</td>
</tr>
<tr>
<td>Confocal Microscopy</td>
<td>Melting Point &amp; Smoke Point Apparatus</td>
</tr>
<tr>
<td>Ion Selective Electrode for Fluoride Analysis</td>
<td>Oxidation Stability Tester</td>
</tr>
<tr>
<td><strong>Computational</strong></td>
<td>Conradsen Carbon Residue</td>
</tr>
<tr>
<td>ASPEN One University Package, ANSYS CFD 18.0, CosmoTherm</td>
<td>Planetary Ball Mill</td>
</tr>
<tr>
<td>MATLAB, ABSOFT, COMSOL Multiphysics</td>
<td>pH and Temperature Controlled Fermentor</td>
</tr>
<tr>
<td>Open Source Coding Platforms &amp; Data Visualization Tools</td>
<td>Membrane Caster</td>
</tr>
<tr>
<td>Computer Aided Design Laboratory</td>
<td>Dead-end Filtration Cell</td>
</tr>
<tr>
<td>GC– MSMS</td>
<td>Hollow Fiber Spinneret Unit</td>
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<tr>
<td>K-Alpha XPS</td>
<td>Hollow Fiber Cross Flow Cell</td>
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<tr>
<td>HPLC</td>
<td>Four-Probe Potentiostat Cell</td>
</tr>
<tr>
<td>NMR Spectroscopy</td>
<td></td>
</tr>
</tbody>
</table>
Faculty

Dr. Banasri Roy
Associate Professor and HOD

Ph.D.: Colorado School of Mines, USA
M.Tech.: IIT Kanpur, India

RESEARCH INTERESTS
- Nanocatalysts and Hydrogen production from biomass
- Biomedical materials
- Solar cell devices and processing of solar cell materials
- Fuel cell materials

SELECTED PUBLICATIONS:

Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/broy/profile

Dr. Arvind Kumar Sharma
Associate Professor

Ph.D.: IIT Madras, India
M.S.: IIT Madras, India

RESEARCH INTERESTS
- Water and Wastewater Treatment
- Fluidization
- Bioreactor Analysis and Design
- Reaction Mechanism and Kinetics

SELECTED PUBLICATIONS:
- A. Pahwa and A. K. Sharma, Optimization of Multi-Stage Fluidized Bed using Amine Sorbent as an Alternative to Alkanol-Amine for Deep Sour Gas Removal, 36th National Convention of Chemical Engineers (online mode), March 6-7, 2021, Durgapur, India.
- Roshan Chandra, Raman Sharma and Arvind Kumar Sharma, Attrition of Bed Particles in a Recirculating Fluidized Bed Reactor, IEA Clean Coal Centre's 8th International Conference on Clean Coal Technologies (CCT 2017), May 8 - 12, 2017, Cagliari, Italy.

Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/arvinds/Profile

Dr. Suresh Gupta
Associate Professor

Ph.D.: BITS Pilani, Pilani Campus
M.Tech.: IIT Kanpur, India

RESEARCH INTERESTS
- Environmental Engineering
- Separation Processes
- Modeling and Simulation
- Computational Transport Phenomena
- Environmental Management Systems (LCA, EIA)

SELECTED PUBLICATIONS:

Google Scholar Page: https://scholar.google.com/citations?user=tqwaWI8AAAAJ&hl=en&oi=ao
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/sureshg/profile
Dr. Hare Krishna Mohanta  
Associate Professor  
**Ph.D.** : BITS Pilani, Pilani Campus  
**M.Tech.** : IIT Kanpur, India

**RESEARCH INTERESTS**
- Process Modeling and Control  
- Reactive distillation  
- Petroleum refining  
- Modeling and Simulation  
- Fuel cell materials

**SELECTED PUBLICATIONS:**

**Google Scholar Page** : https://scholar.google.co.in/citations?hl=en&user=cxaKC3MAAAAJ  
**Faculty Profile Webpage** : https://universe.bits-pilani.ac.in/pilani/harekrishna/profile

Dr. Pratik N. Sheth  
Associate Professor  
**Ph.D.** : BITS Pilani, Pilani Campus, India  
**M.E.** : BITS Pilani, Pilani Campus, India

**RESEARCH INTERESTS**
- Thermo-chemical Conversion of Biomass/RDF  
- Pyrolysis and Gasification  
- Modeling and Simulation  
- Computational Fluid Dynamics  
- Alternate Energy Resources

**SELECTED PUBLICATIONS:**

**Google Scholar Page** : https://scholar.google.com/citations?hl=en&user=S6Im2SYAAAAJ  
**Faculty Profile Webpage** : https://universe.bits-pilani.ac.in/pilani/pratik/profile

Dr. Smita Raghuvanshi  
Associate Professor  
**Ph.D.** : BITS Pilani, Pilani Campus, India  
**M.E.** : BITS Pilani, Pilani Campus, India

**RESEARCH INTERESTS**
- Environmental and Biochemical Engineering  
- Life Cycle Assessment (LCA) of Engineering Processes using Umberto LCA Software

**SELECTED PUBLICATIONS:**

**Google Scholar Page** : https://scholar.google.com/citations?user=EtO5v14AAAAJ&hl=en&oi=ao  
**Faculty Profile Webpage** : https://universe.bits-pilani.ac.in/pilani/smita/profile
Dr. Pradipta Chattopadhyay
Assistant Professor
Ph.D. : University of Tulsa, USA
M.S. : Texas A&M University-Kingsville, USA

RESEARCH INTERESTS
• Foam property evaluation
• Modeling and characterization
• Aqueous foam stability
• Aqueous Foam and Surfactant Based Applications

SELECTED PUBLICATIONS:

Google Scholar Page : https://scholar.google.com/citations?user=AQ4sbhsAAAAJ&hl=en&oi=ao
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/pradipta/profile

Dr. Srinivas Appari
Assistant Professor
Post Doc.: IMCE, Kyushu University, Japan.
P.h.d. : IIT Hyderabad, India
M.Tech. : JNTU Hyderabad, India

RESEARCH INTERESTS
• Heterogeneous Catalysis
• Detailed Kinetic Modeling
• Waste to Energy & Transportation fuels
• Modeling, Simulation & Control

SELECTED PUBLICATIONS:

Google Scholar Page : https://scholar.google.com/citations?user=AQ4sbhsAAAAJ&hl=en&oi=ao
Faculty Profile Webpage: https://www.bits-pilani.ac.in/pilani/srinivasappari/profile

Dr. Ajaya Kumar Pani
Assistant Professor
Ph.D. : BITS Pilani, Pilani Campus, India
M.Tech.: IIT BHU, India

RESEARCH INTERESTS
• Process Control and Process Modelling
• Virtual Instrumentation
• Artificial Intelligence and Soft Computing Applications in Chemical Engineering

SELECTED PUBLICATIONS:

Google Scholar Page : https://scholar.google.co.in/citations?user=T67UsvkAAAAJ&hl=en
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/akpani/profile
Dr. Amit Jain
Assistant Professor
Ph.D.: BITS Pilani, Pilani Campus, India
M.E.: BITS Pilani, Pilani Campus, India

RESEARCH INTERESTS
• Process Control
• Environmental Engineering
• Biochemical Engineering
• Fluid Mechanics
• Modeling and Simulation

SELECTED PUBLICATIONS:
• V. Revanth, S. Gaur and A. Jain, Effect of aeration rates on rhamnolipid production by Pseudomonas aeruginosa in a batch bioreactor, Proceedings of Recent Advancements in Biochemical Engineering and Biotechnology [RABEB-2019], (2019), School of Biochemical Engineering, Indian Institute of Technology (BHU) Varanasi, India.
• V. Revanth, G. Shailee and A. Jain, Effect of aeration rates on rhamnolipid production by Pseudomonas aeruginosa in a batch bioreactor, Proceedings of Recent Advancements in Biochemical Engineering and Biotechnology [RABEB-2019], (2019), Indian Institute of Technology (BHU) Varanasi, India.

Google Scholar Page: https://scholar.google.com/citations?user=bNgEQ7wAAAAJ&hl=en&oi=ao
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/amitjain/profile

Dr. Priya C. Sande
Assistant Professor
Ph.D.: BITS Pilani, Pilani Campus, India
M.E.: BITS Pilani, Pilani Campus, India

RESEARCH INTERESTS
• Computational Fluid Dynamics
• Powder Technology
• Petroleum Engineering
• Machine Learning
• Engineering Education and Lateral Thinking

SELECTED PUBLICATIONS:

Google Scholar Page: https://scholar.google.com/citations?user=HFMkLYkAAAAJ&hl=en&oi=sra
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/priya/Profile

Dr. Bhanu Vardhan Reddy Kuncharam
Post Doc.: Worcester Polytechnic Institute, USA
P.h.D.: Texas A&M university, Texas, USA

RESEARCH INTERESTS
• Membrane Separations (Mixed Matrix Membranes, Catalytic Membranes)
• Computational Fluid Dynamics,
• Catalysis and Reactor Engineering

SELECTED PUBLICATIONS:
• B.V.R Kuncharam, and A.G Dixon, "Multi-scale two-dimensional packed bed reactor model for industrial steam methane reforming", Fuel Processing Technology, 2020, 200, p. 106314

Google Scholar Page: https://scholar.google.com/citations?user=kkBb-dMAAAAJ&hl=en
Faculty Profile Webpage: https://universe.bits-pilani.ac.in/pilani/bhanuvardhan/profile
Dr. Krishna C. Etika
Post Doc.: IIT Madras, India
Ph. D. : Texas A&M University, Texas, USA
M.Tech. : IIT Kharagpur, India

RESEARCH INTERESTS
- Multifunctional Materials
- Polymer Nanocomposites
- Nanotechnology
- Stealth Technology

SELECTED PUBLICATIONS:

Google Scholar Page : https://scholar.google.com/citations?user=e4kYT2IAAAAJ&hl=en&oi=sra
Faculty Profile Webpage: https://www.bits-pilani.ac.in/pilani/etikakrishna/Profile

Dr. Somak Chatterjee
Assistant Professor
Industrial Experience: GE appliances and Marmon Waters
Ph.D. : IIT Kharagpur, India
M.Tech. : IIT Kharagpur, India

RESEARCH INTERESTS
- Adsorption
- Membrane
- Sensors
- Aesthetic Design
- Biocidal Extraction

SELECTED PUBLICATIONS:
- S. Chatterjee, A. Jain, S. De, Cloud point assisted extraction for preconcentration of thymol from water extract of Ajwain (Trachyspermum Ammi L.) seeds, Journal of Food Science and Technology, 54, (2017), pp. 4353-4361.

Google Scholar Page : https://scholar.google.com/citations?user=6OfOUlwAAAAJ&hl=en&oi=ao
Faculty Profile Webpage: https://www.bits-pilani.ac.in/pilani/somakchatterjee/profile

Dr. Arkoprovo Ghosal
Assistant Professor
Ph. D.: University of Illinois, Chicago, USA
M.Sc. : University of Stuttgart, Germany

RESEARCH INTERESTS
- Computational Fluid Dynamics
- Micro- and Nano-scale Transport Phenomena
- Hydrodynamics and Rheology of Jets, Films and Drops
- Stochastic modeling of Flow through Porous Media

SELECTED PUBLICATIONS:

Faculty Profile Webpage: https://www.bits-pilani.ac.in/Pilani/arkaprovoghosal/profile
**SELECTED PUBLICATIONS:**


**Google Scholar Page:** [https://scholar.google.co.in/citations?user=gZEIDJIAAAAJ&hl=en](https://scholar.google.co.in/citations?user=gZEIDJIAAAAJ&hl=en)

**Faculty Profile Webpage:** [https://www.bits-pilani.ac.in/pilani/sarbanighosh/profile](https://www.bits-pilani.ac.in/pilani/sarbanighosh/profile)
The department of chemical engineering conducts a Workshop on Analytical Instruments for Chemical and Environmental Engineers (WAICEE) is held biennially. The workshop provides a sound knowledge of the basic principles of analysis, an understanding of the instrumentation involved, and the opportunity to become familiar with practical techniques. The analytical instruments such as Gas Chromatography, High-Performance Liquid Chromatography, Ultraviolet-visible spectroscopy (UV-VIS Spectrophotometer), Atomic Absorption Spectrophotometer, Fourier Transform Infrared Spectrophotometer, Dynamic Foam Analyzer, Thermal Gravimetric Analyzer, X-Ray Diffraction, Gas Chromatography-Mass Spectrometry, Differential Scanning Calorimetry etc. would be covered. The workshop covers theoretical aspects like an introduction to instrumentation, operation, troubleshooting, calibration, method development, and limitations presented by eminent researchers from allied organizations. The sessions also consist of a practical demonstration on the sophisticated instruments mentioned above.

**Professional memberships and Affiliations**

**Chemical Engineering Association**

Chemical Engineering Association (ChEA) is the largest student body of chemical engineering department responsible for handling various affairs conducted by it throughout the year. The core committee for the Association is inducted every year from among the Freshers, who continue to be a part of it in the future. The Association is headed by a Prof-in-charge, while the student leaders are from the third year. The contributions of the first-yearites towards the Association are acknowledged and serve as a key basis for the selection of both - the team of Second Year Representatives and the Annual ChE Deptt. Awards presented to the meritorious students for curricular and extracurricular activities during the Farewell Ceremony. The Farewell Ceremony is conducted every semester at the end of the Second Semester. The Association apart from conducting the Farewell Ceremony every semester also conducts various guest lectures, seminars and talk shows by famous Academicians, Scholars, reputed Scientists and Eminent Industry Experts having humongous contributions in all facets of nation building.

**Indian Institute of Chemical Engineers (IIChE Pilani Capter)**

Indian Institute of Chemical Engineers (IIChE) Pilani Regional Center (PRC) actively engages students and faculty in chemical engineering and allied fields through various activities. IIChE PRC conducts various seminars, workshops and invited lectures. IIChE PRC also mentors Student Chapter which conducts various activities for engaging chemical engineering students. IIChE PRC student chapter recently conducted: (a) The Chemicool Challenge was a trivia based on chemicals from everyday life which saw outstanding participation from all over the country, (b) Chem-e-chronicles is an ongoing series of informative interviews of faculty members and research scholars (both PhD and Master's students) which aims at creating awareness about research work and boosting research culture among the students, especially undergraduates.

**American Institute of Chemical Engineers**

In older times, when the connection with other parts of world was not possible, many a times researchers ended up founding something which was already discovered in other part of world. It would have been so helpful if the researchers had a way of being in touch among themselves and collaborate to enhance the inventions. That exactly serves as the foundational belief of the American Institute of Chemical Engineers (AIChE), the purpose of connecting Chemical Engineering Professionals with a global network of intelligent, resourceful colleagues and their shared wisdom. We, the members of Aiche Bits Pilani aim to delve deeper into core Chemical Engineering and explore various aspects of chemical engineering while focusing on building formal, soft and teamwork skills. We want to create an atmosphere to encourage chemical engineering.
Contact Us

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Birla Institute of Technology and Science (BITS)

Pilani - 333031 (Rajasthan) India

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Department Office: +91-1596-25-5215

E-mail: banasri.roy@pilani.bits-pilani.ac.in