



Indian Institute Of
Technology, Guwahati

Centre For Career Development

Department of
Chemical
Engineering

Department Brochure



About the Institute

Since 1994, when it was founded as the sixth Indian Institute of Technology, IIT Guwahati has become one of the world's most dynamic universities in technology, innovation, and research. The campus lies on a 285-hectare parcel of land on the northern bank of Brahmaputra 20km from the city centre. The curriculum and courses at IIT Guwahati are constantly changing to meet global needs and allow students to explore their interests.

The Institute offers **B.Tech, B.Des, MA, M.Des, M.Tech, MS(R), MBA, M.Sc, and Ph.D** programmes in 11 Departments, 9 Centres, and 5 Schools in all major engineering, science, and humanities areas. Our students can broaden their studies with a 'Minor' degree, open and interdepartmental electives, audit courses, and inter-disciplinary research.

The institute's state-of-the-art laboratories and National Centres of Research have made it a hub for research and technical education.

Apart from world-class research, the faculty prepares students for professional problems by teaching them their fields conceptually. It also helps students participate in worldwide projects, which helps them become pioneers and leaders.

IIT Guwahati has MoUs (Memoranda of Understanding) with top international institutes for semester-based student-exchange programmes and summer internships, boosting global integration and broadening our students' perspectives.

In their holidays, students intern in industrial, managerial, and research fields at top international corporations and research labs, contributing greatly. The institute provides excellent extracurricular opportunities to help students develop holistically.

The Department of Chemical Engineering started functioning in 2002. In the academic arena the Department offers Bachelor's, Master's and Doctoral programmes in Chemical Engineering. The faculty members in the Department are experts in traditional and in the interdisciplinary domains ranging from nanotechnology, bio-engineering, complex fluids to molecular simulations.

The total number of students graduating from the Bachelor's, Master's and Doctoral programmes in the last three years (2022-2024) are 188, 172 and 67 respectively. The alumni from the Department are placed at very respectable positions in the academia and industry. The Department hosts a number of undergraduate laboratories, namely: fluid mechanics, mechanical operations, process control, mass transfer, heat transfer, and reaction engineering. The students are given hands on training in the computational domains through the software used in chemical engineering domain such as Accelrys, Amber 12.0, ASPEN Plus, Mathematica, ChemCAD, ANSYS Fluent, COMSOL Multiphysics and Gaussian.

The department also houses the Centre for Sustainable Polymers (Sus-Pol), which is financed by the Ministry of Chemicals and Fertilizers, Government of India. Department of Chemical Engineering at Indian Institute of Technology, Guwahati started functioning in 2002. The department is a major academic host offering B. Tech., M. Tech., and Ph. D. in Chemical Engineering. The Master of Technology (M.Tech.) degree course with specialisation in "Petroleum Refinery Engineering" was started in 2004. viz. Currently, department offers four specialisations in the M.Tech. degree course (since 2011), viz. (1) Petroleum Science and Technology (2) Materials Science and Technology (3) Computer Aided Process Engineering and (4) International Joint M.Tech Degree in Food Science and Technology. The faculty members of the department are working in traditional Chemical Engineering and interdisciplinary domains ranging from petroleum engineering, nanotechnology, bio-engineering, complex fluids to molecular simulations. The department is endowed with young, vibrant and dynamic faculty well qualified to impart high quality teaching and research in Chemical Engineering

About the Department



Prof. Kaustubha
Mohanty

Message from Head of the Department

The Department of Chemical Engineering at IIT Guwahati has an excellent infrastructure for all round development of its students. The laboratories are well equipped with modern cutting edge instruments for research and development. The department has access to over ten thousand online journals. Students graduating from this institute are motivated, bright and very eager to perform after they graduate. Faculty members and the PhD students have been able to demonstrate substantial intrinsic merit of their research, also some research-activities have excellent connection to Industrial problems. We are well recognized for our research and teaching facilities in India and abroad."

"Our students have continuously been able to display excellent potential and skill in their fields of academics and extra-curricular activities. Many of the students have visited foreign universities of repute to widen their knowledge and experience. The alumni are showing excellence in their respective fields. It is worth mentioning that recruiters from varied fields have responded very enthusiastically and rated our students very high. Their abilities are well attested by the excellent reports we receive from the recruiting companies."

"With this I would like to cordially invite all prospective employers to visit our institute, our department and to participate in the on-campus placement process.



Dr. Abhijit
Kakati

Message from Department Faculty Advisor

“The Department of Chemical Engineering is committed to nurturing well-rounded professionals who are ready to make a meaningful impact in the industry. As the Faculty Placement Representative, it is my pleasure to introduce you to the exceptional talent that our department has to offer. At IIT Guwahati, our Chemical Engineering graduates are equipped with cutting-edge knowledge and hands-on experience, ensuring they are ready to tackle the challenges of the modern industrial landscape. Our students benefit from a rigorous curriculum, state-of-the-art laboratories, and collaborative research opportunities with leading industry partners across diverse domains. In addition to their academic pursuits, our students actively participate in technical seminars, workshops, and industry and academic internships, providing them with valuable exposure to real-world challenges and emerging technologies.”

“They are trained to excel in a wide range of fields, including chemical process design, materials science, environmental engineering, hydrogen technologies, water treatment, membrane technology, AI/ML, food science and technology, petroleum technology, polymer technology, computational fluid dynamics and many more.

We invite you to explore the impressive capabilities of our graduates. Their problem-solving skills, innovative mindset, and strong work ethic make them valuable assets to any organization. We are confident that they will exceed your expectations and contribute significantly to your success.”

PROGRAMMES OFFERED

Undergraduate

Bachelor of Technology (B.Tech.) degree in Chemical Engineering follows an eight semester system. The curriculum is designed to impart fundamental principles as well as recent advancements in Chemical Engineering. The syllabi include Humanities, Computer, Mechanical, and Chemical engineering sciences.

LINK : iitg.ac.in/acad/CourseStructure/Btech2018/CL_updated_23032020.htm

Postgraduate

The Master of Technology (M.Tech) degree course with specialisation in "Petroleum Refinery Engineering" was started in 2004. Currently, the department offers four specialisations in the M.Tech. degree course (since 2011), viz.

1. Petroleum Science and Technology ([Course Structure link](#))
2. Materials Science and Technology ([Course Structure link](#))
2. Computer Aided Process Engineering ([Course Structure Link](#))
3. International Joint M.Tech Degree in Food Science and Technology

to the candidates selected through GATE (Graduate Aptitude Test in Engineering). The masters degree courses follow a four semester system. In the first two semesters, the postgraduate students are exposed to advanced common courses of Chemical Engineering as well as specialization related courses. The curriculum involves one year of thesis work (semesters III and IV) which includes fundamental and applied research.

Doctoral Degree

The doctoral programme requires a minimum necessity of taking four course work in the first two semesters. After the completion of course work, the doctoral students have to appear for the Ph.D. comprehensive examination. The research scholar is further allowed to carry out his/ her research work after successful completion of the Ph.D. comprehensive examination. The optimum duration for the doctoral programme is about five years.

LINK : https://www.iitg.ac.in/acad/academic_prog.php#Doctoral

COURSES OFFERED (UG, PG & PHD)

CORE COURSES

- Chemical Process Calculations
- Fluid Mechanics
- Solid Fluid Operations
- Chemical Engineering Thermodynamics (incl. Advanced level)
- Mass Transfer
- Heat Transfer
- Chemical Reaction Engineering (incl. Advanced level)
- Process Equipment Design
- Process Control and Instrumentation (incl. Advanced level)
- Process Engineering and Economics
- Computer Aided Numerical Methods (incl. Advanced level)
- Characterization of Material
- Fundamentals of Material Science and Engineering
- Smart Materials
- Transport Phenomena (incl. Advanced level)
- Petroleum Refinery Engineering
- Petroleum Production Engineering
- Petroleum Reservoir Engineering
- Process Modelling and Simulation

DEPARTMENT ELECTIVES

- Artificial Intelligence and Machine Learning in Chemical Engineering
- Polymer Science and Technology
- Fluidization Engineering Catalysts and Adsorbents
- Multiphase Flow
- Applied Rheology
- Computational Fluid Dynamics
- Energy Resources
- Colloid and Interface Science
- Molecular Simulation
- Fundamentals of Micro Nano Fluids and Microfabrication
- Applied Statistics for Chemical Engineers
- Data Science for Chemical Engineers
- Advanced Clean Fuel Technologies
- Natural Gas Engineering
- Optimization Techniques
- Composite Materials
- Advanced Food Processin
- Bioprocess Engineering
- Membranes

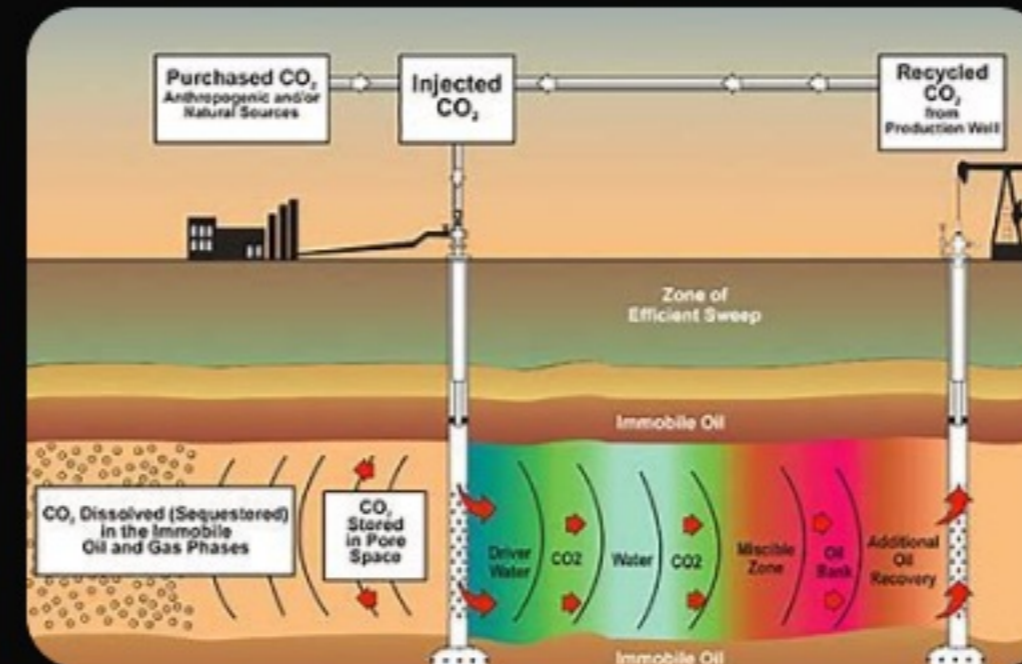
RESEARCH AREAS



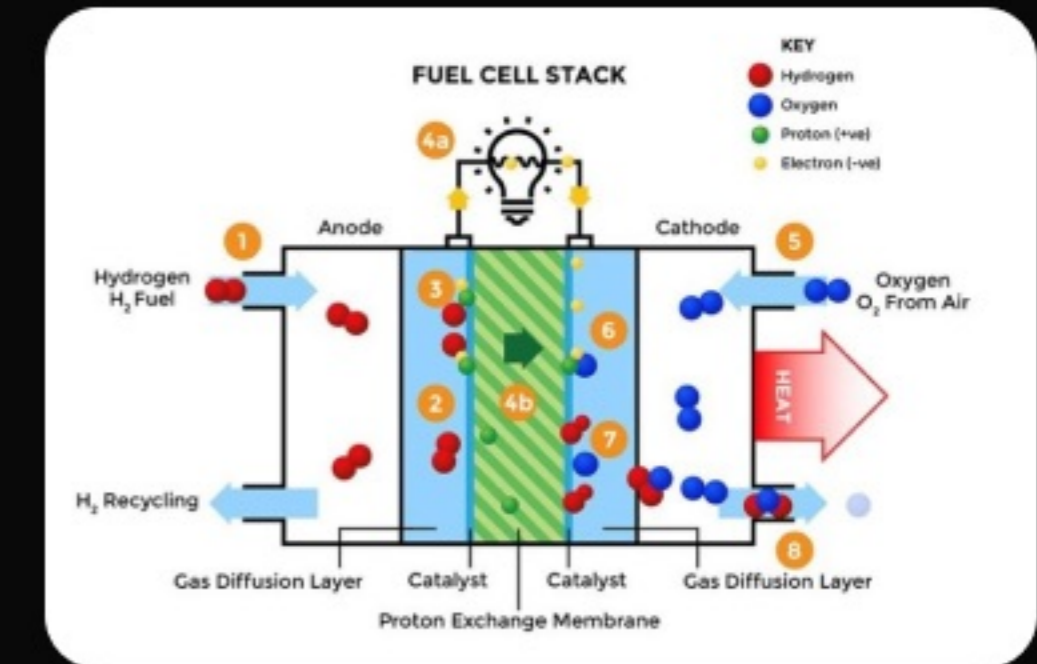
BIOFUELS



COMPLEX FLUIDS



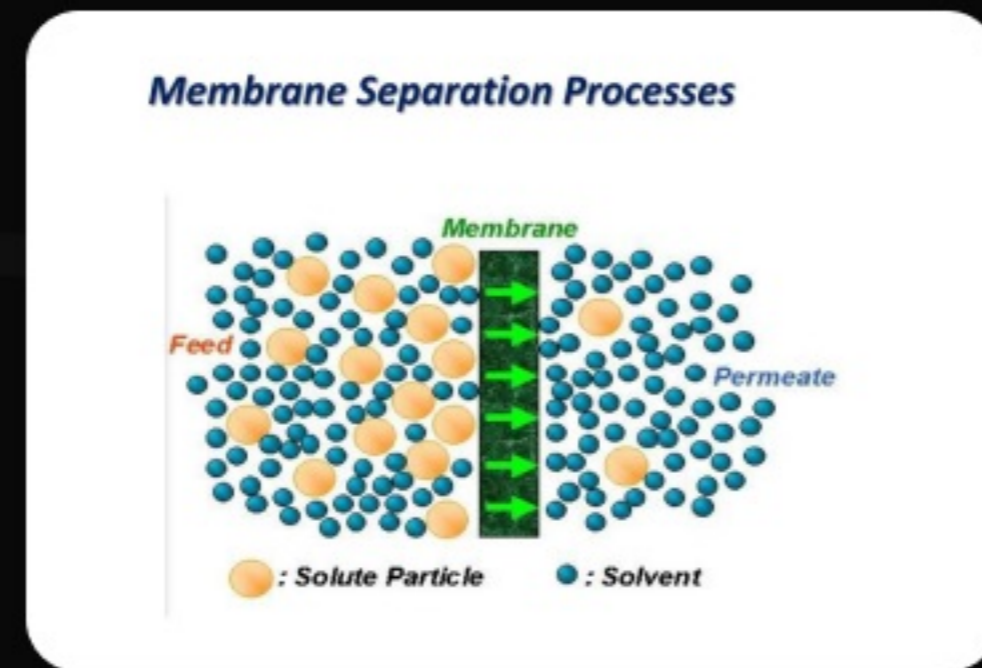
ENHANCED OIL RECOVERY



FUEL AND SOLAR CELLS



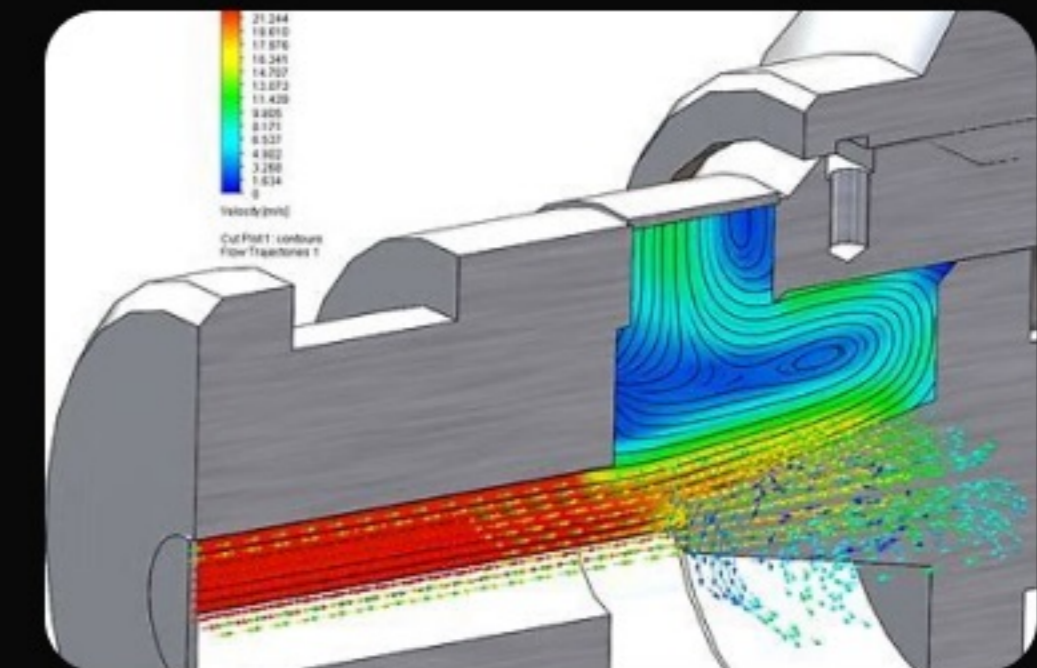
GREEN CHEMISTRY



MEMBRANE SEPARATION PROCESSES

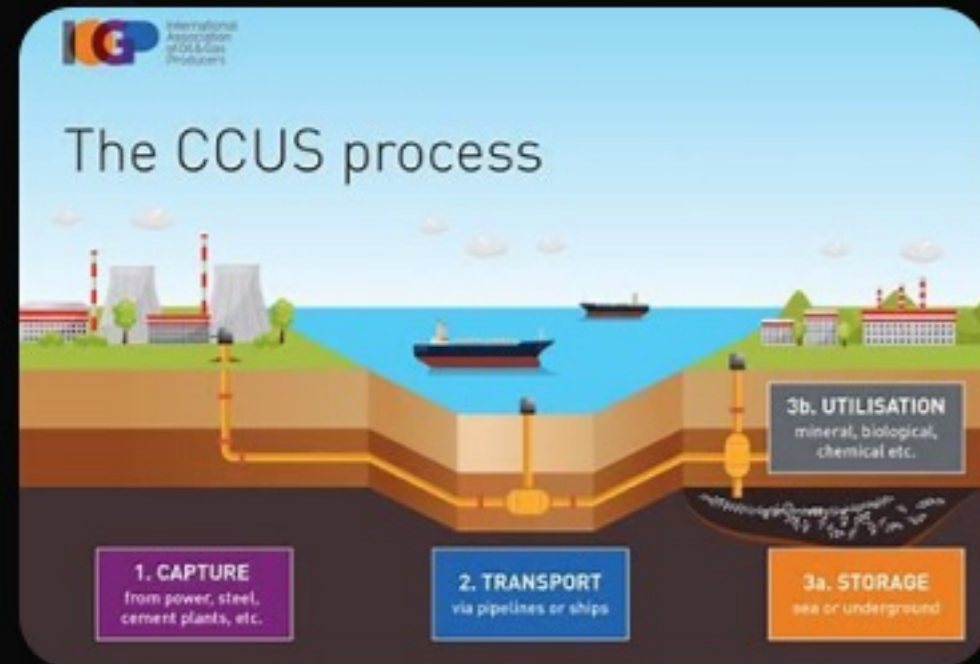


FOOD SCIENCE & TECH



COMPUTATIONAL FLUID DYNAMICS

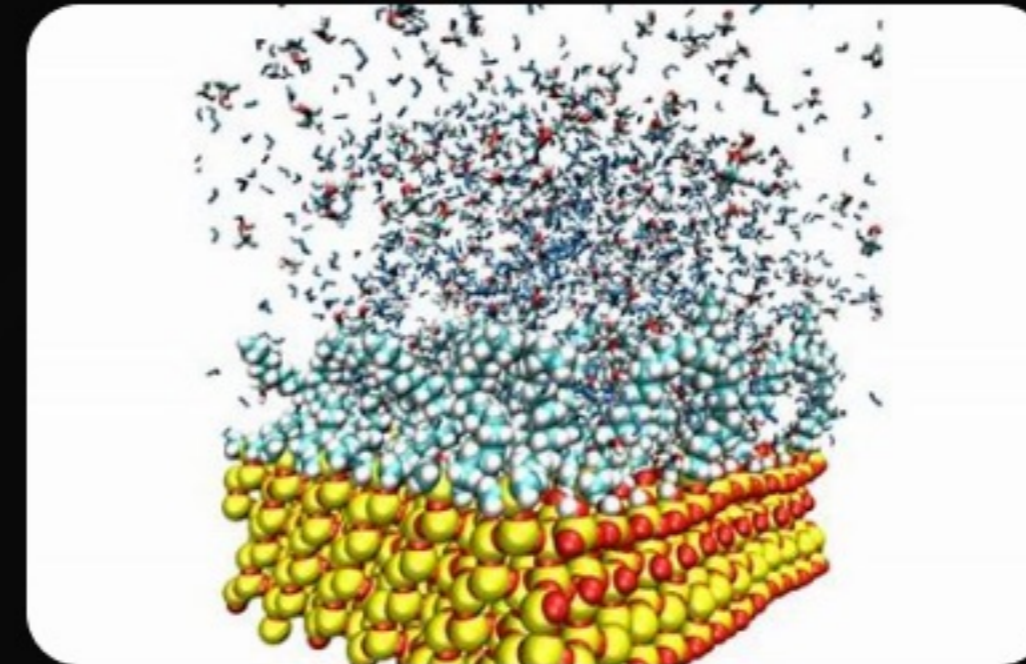
RESEARCH AREAS (CONTD.)



CCUS



NANOMATERIALS



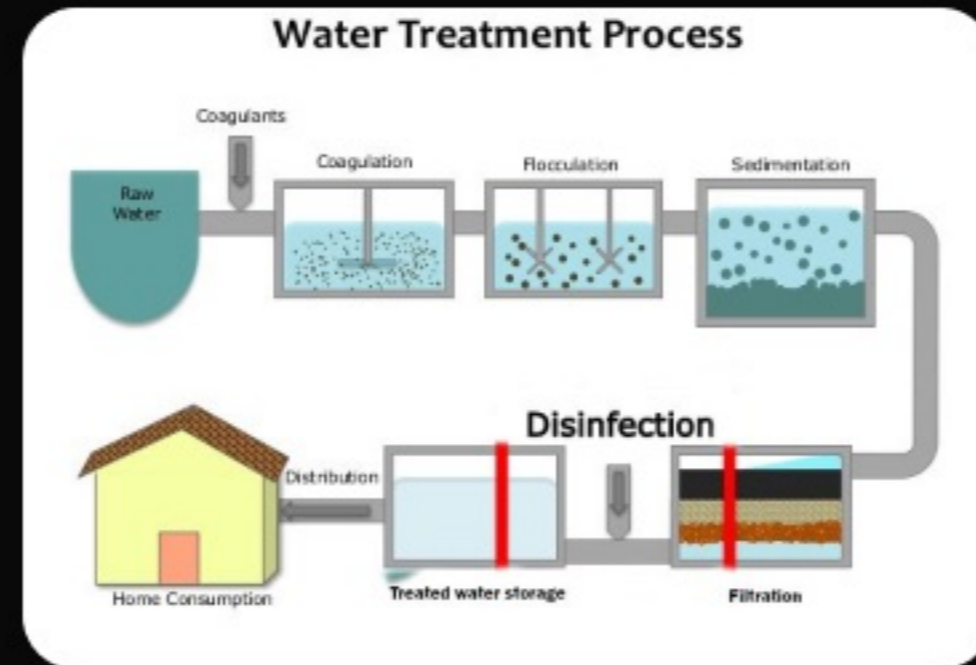
MOLECULAR SIMULATION



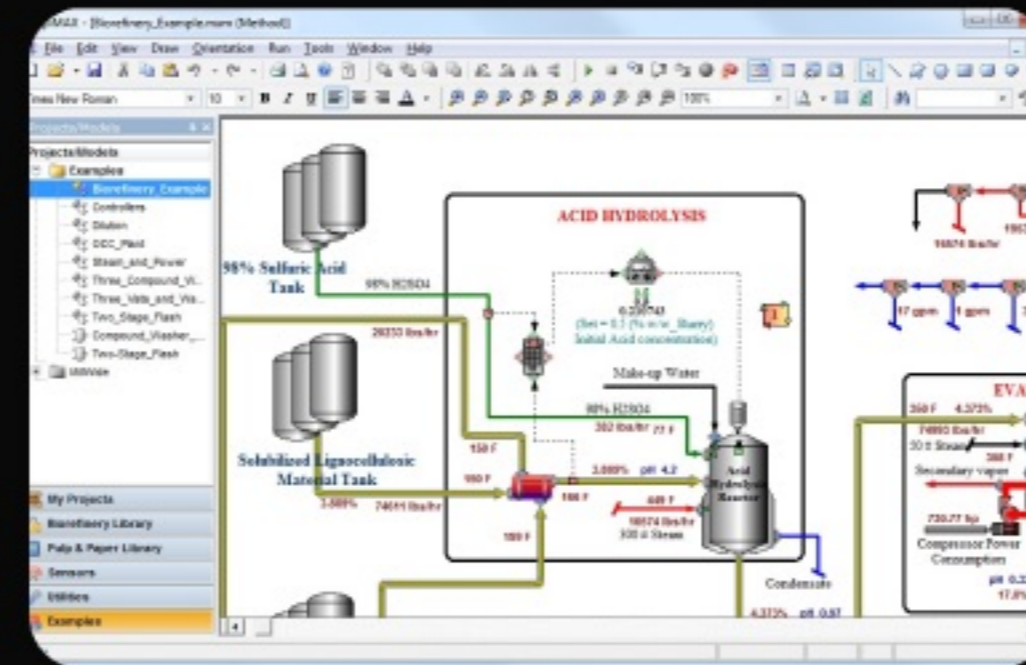
WASTE MANAGEMENT



MACHINE LEARNING



WATER TREATMENT



PROCESS SIMULATION



POLYMER SCIENCE & TECH

ET THE ECONOMIC TIMES | News

IIT Guwahati Researchers develop new method to produce a sugar substitute 'Xylitol' from sugarcane waste

ET THE ECONOMIC TIMES | News

ETPrime

IIT Guwahati researchers make hydrogen breakthrough

The Indian EXPRESS
JOURNALISM OF COURAGE

IIT Guwahati researchers develop edible coating to extend fruits and vegetables' shelf life

IIT Guwahati researchers have developed a non-toxic and edible coating that was found to extend the shelf life of fruits and vegetables during laboratory tests.

INDIA TODAY NE

IIT Guwahati develops Sustainable Microalgae Biorefinery Model and Bioalcohols Production

Under the Sustainable Microalgae Biorefinery Model, the Institute is working on multiple projects to contribute towards Sustainable Energy.

TIMES NOW

IIT Guwahati Researchers Use Microfluidics to Study Root Nutrient Absorption

IIT Guwahati researchers have developed an affordable microfluidic system that mimics soil, boosting root growth and nitrogen absorption to enhance crop yields.

Edited by: Animesh Bhardwaj | Updated Aug 4, 2024, 15:23 IST



ET THE ECONOMIC TIMES | Industry

ETPrime

IIT Guwahati partners with NTPC for development of plant to capture CO2

TOI THE TIMES OF INDIA

INNOVATION: IIT-Guwahati develops tech to generate green energy by treating wastewater

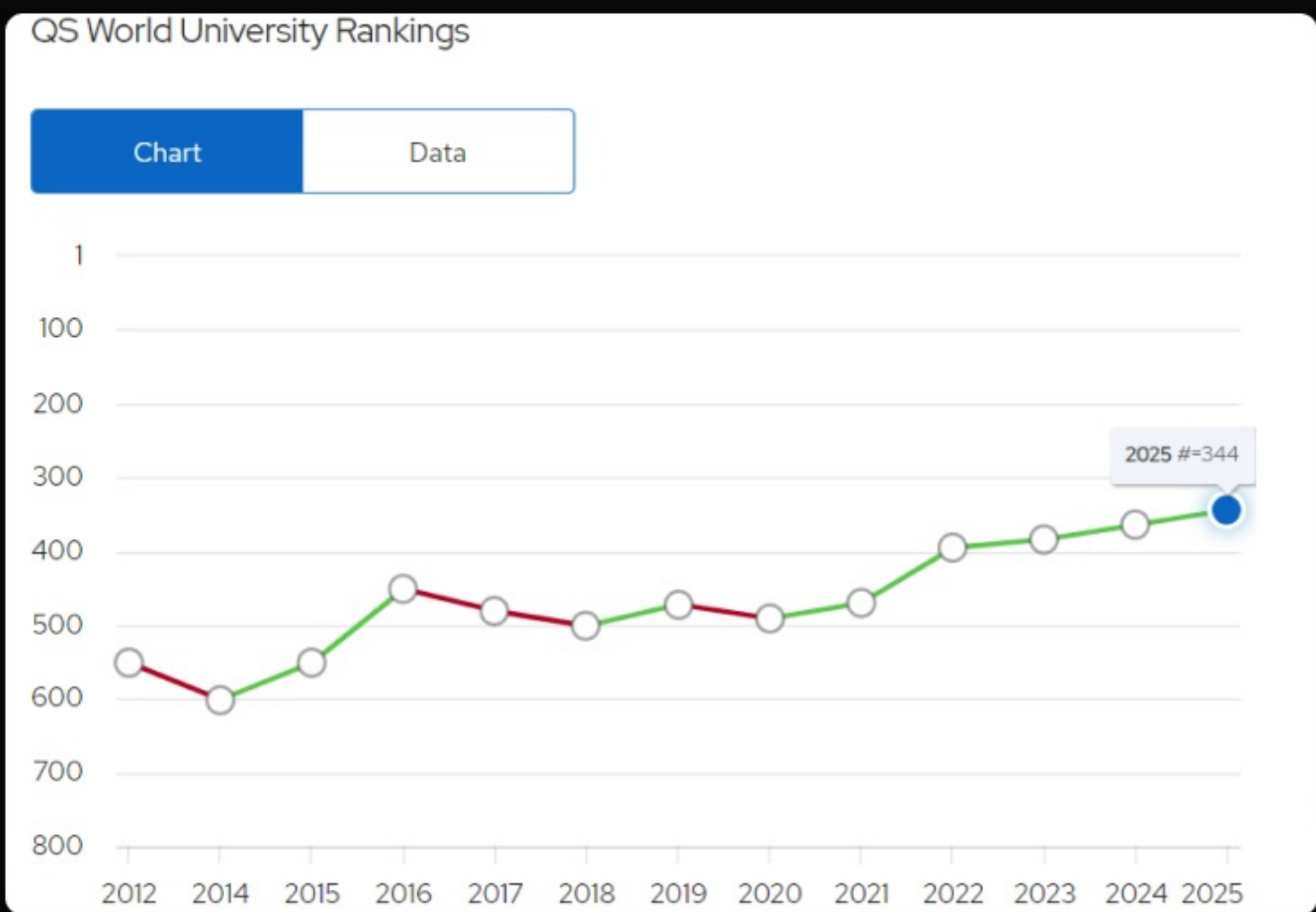
The IIT-G sources on Wednesday said that the use of organic material such as waste water in MFC makes it an eco-friendly device that offers a dual benefit of bioelectricity generation and waste management.

Rankings & ratings QS TOP UNIVERSITIES

RANKINGS

Indian Institute of Technology Guwahati (IITG) is one of the top public universities in Guwahati, India. It is ranked #=344 in QS World University Rankings 2025.

#=344 QS World University Rankings	#51-70 QS WUR Ranking By Subject	#1001-1050 QS Sustainability Ranking	#12 Asian University
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IIT Guwahati retains #7 Position in the 'Engineering' Category of NIRF Rankings 2024

The Institute has retained #7 in 'Engineering', #9 in 'Overall' and gained #10 in 'Research' Categories, in NIRF Ranking 2024 launched by Shri Dharmendra Pradhan, Hon'ble Union Minister of Education, Government of India, today.

INDIA TODAY

IIT Guwahati climbs to 344th place in QS World University Rankings 2025

IIT Guwahati has surged 20 positions, now securing the 344th spot in the QS World University Rankings 2025. Particularly noteworthy is its Research Citations per Faculty, standing out as the 42nd globally, showcasing its robust academic performance.



HoD of the chemical engineering department, Prof. Kaustubha Mohanty, has recently been selected as a member of the Editorial Advisory Board of ACS ES&T Water and Journal of Analytical and Applied Pyrolysis (Elsevier).

LABORATORIES

UG & PG LABS

- Fluid Mechanics Lab
- Heat Transfer Lab
- Mass Transfer Lab
- Mechanical Operations Lab
- Petroleum Lab
- Process Control Lab
- Reaction Engineering Lab
- Thermodynamics Lab

RESEARCH LABS

- Fuel & Energy Lab
- Meso-Scale Engineering & Soft Materials Lab
- Molecular Simulation & Interface Engineering Lab
- Reservoir Rock Fluid Interaction Lab
- Soft Matter Research Lab
- Transport Processes Lab
- Water Treatment Lab
- Corrosion , Materials Lab
- Advanced Materials , Separation Processes Lab
- Applied Multiphase Process Research Lab
- Bio-energy , Waste Management Lab
- Catalysis, Environment , Energy Research Lab
- CCUS Technology Lab
- Chemical Process Engineering Lab
- Flow Visualization Lab

FACILITIES AVAILABLE IN ANALYTICAL LAB

- Atomic Absorption Spectrophotometer (AAS)
- BET Surface Area Analyzer
- Differential Scanning Calorimetry (DSC)
- Fourier Transform Infrared Spectroscopy (FTIR)
- Gas Chromatography-Mass Spectrometer (GC-MS)
- High Performance Liquid Chromatograph with RI & UV detector (HPLC)
- Laser Particle Size Analyser (LPSA)
- Lyophilizer
- Mercury Porosimeter
- Rheometer
- Spinning Drop Tensiometer
- Thermo Gravimetric Analyser (TGA)
- TOC Analyser
- UV Visible Spectrophotometer
- It also boasts of a well built **Computer Center** with various latest licensed Softwares

ONGOING PROJECTS

Development of low cost, sustainable and efficient electro-catalyst and proton exchange membrane for electrolyzer assembly for producing Green Hydrogen.

The research project focuses on the development of transition metal-based anodic and cathodic electrocatalysts for the hydrogen evolution reaction (HER) and oxygen evolution reaction (OER).



Polymer-Based Membranes for Enhanced Desalination and Wastewater Treatment via Molecular Dynamics Simulations

The research project focuses on optimizing polymer membranes for desalination and wastewater treatment using molecular dynamics simulations, addressing separation mechanisms and proposing industrial applications for improved efficiency



Thermochemical Conversion of Biomass and Plastics to Value-Added Biofuels

The research project focuses on catalytic hydrodeoxygenation of bio-oil from biomass and plastic waste, producing sustainable aviation fuel through co-pyrolysis and rigorous optimization for circular economy integration.



Development of Cost-Effective Semiconductor-Based Photoelectrodes for Green Hydrogen

The research project focuses on developing semiconductor-based photoelectrodes through electrodeposition to lower costs in green hydrogen production, leveraging advanced electrochemical techniques.



DEPARTMENT ACTIVITIES

Frontiers in Chemical Engineering (A monthly webinar series)

The department of Chemical Engineering at IIT Guwahati under the aegis of Azadi Ka Amrit Mahotsav organizes a series of monthly webinars named Frontiers in Chemical Engineering. As a part of this, several distinguished Chemical Engineers share their research and wisdom. It gives a brilliant opportunity for our students to listen to such luminaries and learn from them.



IChE-GRC (Indian Institute of Chemical Engineers, Guwahati Regional Centre)

It is one of the most active regional centers of IChE, which is in the Department of Chemical Engineering, IIT Guwahati. Mahotsav organises a series of monthly webinars named Frontiers in Chemical Engineering. As a part of this, several distinguished Chemical Engineers share their research and wisdom. It gives a brilliant opportunity for our students to listen to such luminaries and learn from them.



FIPI (Federation of Indian Petroleum Industry) - Student Chapter

The FIPI Student Chapters were instituted to provide a common platform to academicians, students, technologists and management experts of the university/college for regular exchange of ideas in the field of energy with special reference to Oil & Gas and Petroleum Technology.



SPE(Society of Petroleum Engineers)-Student Chapter

IIT Guwahati SPE Student Chapter has organised Symposium on Energy Transition - Concepts, Opportunities and Challenges; Workshop on Applied Statistical Modelling and Data Analytics for Petroleum Engineering and related Applications; Invited talk on Energy Transition and its impact on petrochemical industries; Flow through porous medium Basics of modelling.



PAST RECRUITERS



and many more...



MANUFACTURING INDUSTRIES



CONSTRUCTION & MINING



BIOTECHNOLOGY

AUTOMATIVE INDUSTRIES



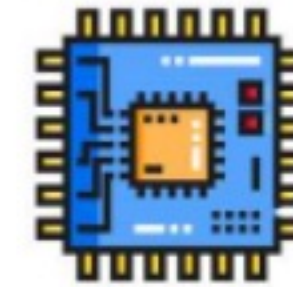
PETROCHEMICALS



POWER PLANTS

WHERE WE FIT IN?

ELECTRONICS



OIL & GAS INDUSTRIES

CHEMICAL & PHARMACEUTICALS



FMCGS

CONTACT US



We are looking forward to have you on our Campus.

Head Of The Department



Prof. Kaustubha Mohanty

Phone : +91 3612582267

Faculty Placement Representative



Dr. Abhijit Kakati

Phone : +91 9600117941

Overall Placement Coordinator



Jagdish Panda

Phone : +91 9337218041



Sayak Bhattacharya

Phone : +91 9265744976

Department Placement Representative



B-Tech

Rajat Singhal

Phone : +91 9024427927



M-Tech

Huda Naveed Khan

Phone : +91 9660310314



PhD

Bineet Tripathi

Phone : +91 9997266466

E-Mail : placement@iitg.ac.in/ ccd@iitg.ac.in

Website : iitg.ac.in/ccd

Phone no : 0361258 2171/2175

Centre for Career Development (CCD),

First Floor, Administrative Building,

Indian Institute of Technology Guwahati, Guwahati, Assam - 781039.