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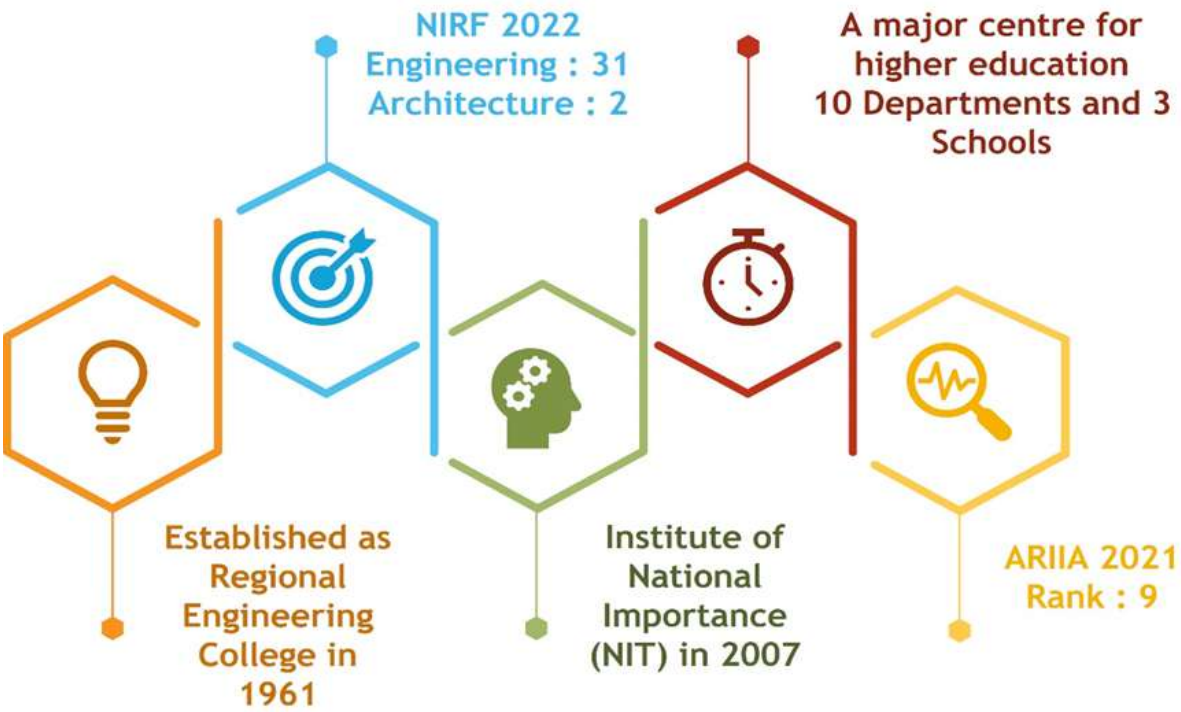
NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

DEPARTMENT OF CHEMICAL ENGINEERING

ABOUT THE INSTITUTE



ABOUT THE DEPARTMENT

Established in 2006, the department offers B.Tech, M.Tech and Ph.D in Chemical Engineering. The department is recognized primarily for its continual improvement in academic output, and involved in a wide spectrum of active interdisciplinary research with 23 dynamic faculty, motivated students, efficient technical and supporting staff with excellent state of the art laboratories. A continuous improvement in the curriculum is adopted in each academic year in consultation with department advisory board (DAB) consisting of eminent academic personalities, industry professionals, and alumni so as to meet the emerging challenges faced by the industry. The vibrant research culture in the department is visible from the sponsored projects by various departments and organizations including the MHRD, SERB, DST, R&D TATA Steel, SPARC, and KSCSTE etc. The Department is also actively involved in conducting International Conferences, Faculty Development Programmes, Job-oriented Short-term Training Programmes and Continuing Education Programmes for Engineering professionals and academic faculty.

VISION: To be a global leader in chemical engineering education, creating well qualified engineers of high calibre who can contribute to their profession and are equipped with necessary traits to handle future technological challenges pertaining to chemical engineering and allied fields.

MISSION:

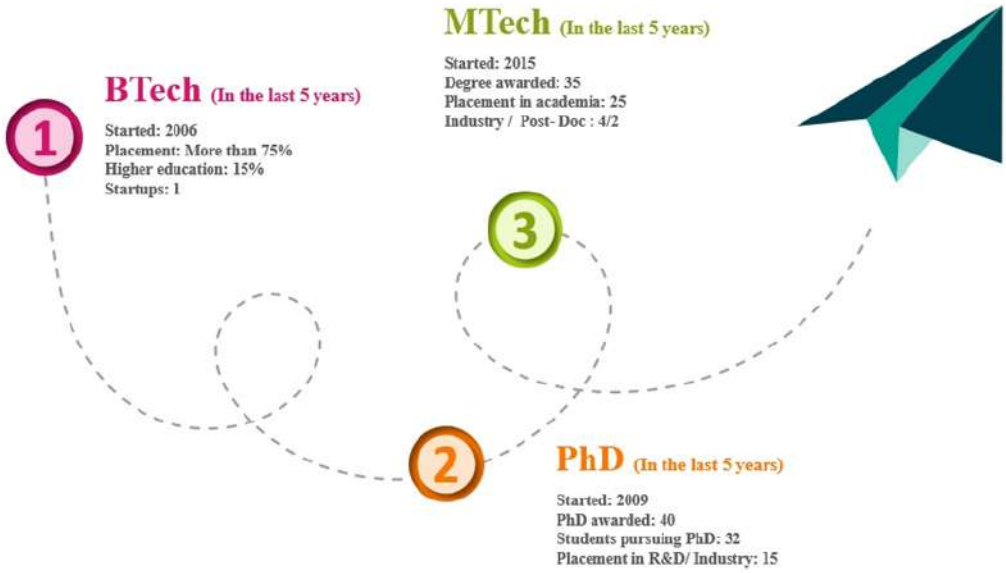
- Offer high quality education in scientific and engineering aspects of chemical engineering.
- Impart engineering and research skills to the students to make them innovative and competitive with the changing needs of industry and environment.
- Create awareness of social responsibilities in students to serve the society

PROGRAM EDUCATIONAL OBJECTIVES

- **PEO1:** Practice chemical engineering in traditional and emerging fields.
- **PEO2:** Excel in advanced studies with strong foundation laid in the undergraduate education.
- **PEO3:** Exhibit leadership, ethical attitude, communication skills, teamwork in their profession and multidisciplinary skills.
- **PEO4:** Engage in lifelong learning and continuous professional development.

PROGRAMS OFFERED

- **UNDER GRADUATION -** B. Tech. in Chemical Engineering
- **POST GRADUATION -** M. Tech. in Chemical Engineering
- **DOCTORAL PROGRAMME (Ph. D.) -** Chemical Engineering and allied disciplines



FACILITIES - CLASSROOMS / SEMINAR HALLS

1. Conference Room
2. Seminar Hall -Capacity 90
3. UG Class rooms
   - CH (203, 204, 209A, 209B, 209C, 209D)
   - ECLC (N,F)
   - PG Class rooms: MAT 305

All classrooms/seminar halls are equipped with Black Board, White Board, LCD Projector, PA system and smart board wherever required.

LABORATORIES

- **UG Laboratories**
  1. Chemical Analysis Laboratory
  2. Fluid Mechanics Laboratory
  3. Mechanical Operation Laboratory
  4. Heat Transfer Laboratory
  5. Mass Transfer Laboratory
  6. Chemical Reaction Engineering Laboratory
  7. Process Dynamics and Control Laboratory
  8. Computer Laboratory
  9. Project Laboratory
     -- To conduct experiments related to undergraduate projects

- **Special Laboratories**

Instrumentation Laboratory

-- Sophisticated instruments for measuring/characterizing the material properties that can be used for the research related experimental projects

Fluid Mechanics laboratory

Heat transfer laboratory

Chemical Analysis laboratory

Mass transfer laboratory

Computer laboratory

Instrumentation laboratory

SOFTWARES

ANSYS

COMSOL MULTIPHYSICS

aspentech

MFiX

SolidWorks

LabVIEW

FACULTY DETAILS

S.No	Name	Designation	Specialization
1	Dr. Haribabu K	Associate Professor & HOD	Microbial Fuel cell, Nano Fluids, Waste water treatment, Adsorption
2	Dr. Shiny Joseph	Professor	Membrane Applications, Fuel Cell
3	Dr. V Sivasubramanian	Professor	Biochemical Engineering, Fluidization Engineering, Biofuels, Effluent Treatment
4	Dr. Lity Alen Varghese	Professor	Polymer Technology, Adhesives and surface coatings, Nanocomposites
5	Dr. Aparna K	Associate Professor	Process simulation and control, Biofuels
6	Dr. M V Pavan Kumar	Associate Professor	Design, Modeling, Simulation and Control, Control of Reactive Distillation Systems, Process heat integration
7	Dr. S Bhuvaneshwari	Associate Professor	Wastewater treatment, Separation processes, Electrochemical sensors
8	Dr. Panneerselvam Ranganathan	Associate Professor	Chemical reactor modelling, Computational flow modelling, Thermochemical conversion of biomass, CO2 capture storage & conversion
9	Dr. Vineesh Ravi	Assistant Professor	Fuel cells, control of reactive distillation columns
10	Dr. Chandrasekhar Bestha	Assistant Professor	Control Systems, Multivariable Controller Design, PID Controller Tuning
11	Dr. Noel Jacob K	Assistant Professor	Membrane based Technologies, Water treatment, fuel cells
12	Dr. Sudev Das	Assistant Professor	Micro/Nanoscale phase change heat transfer, Boiling and Condensation, Solar thermal energy storage and applications

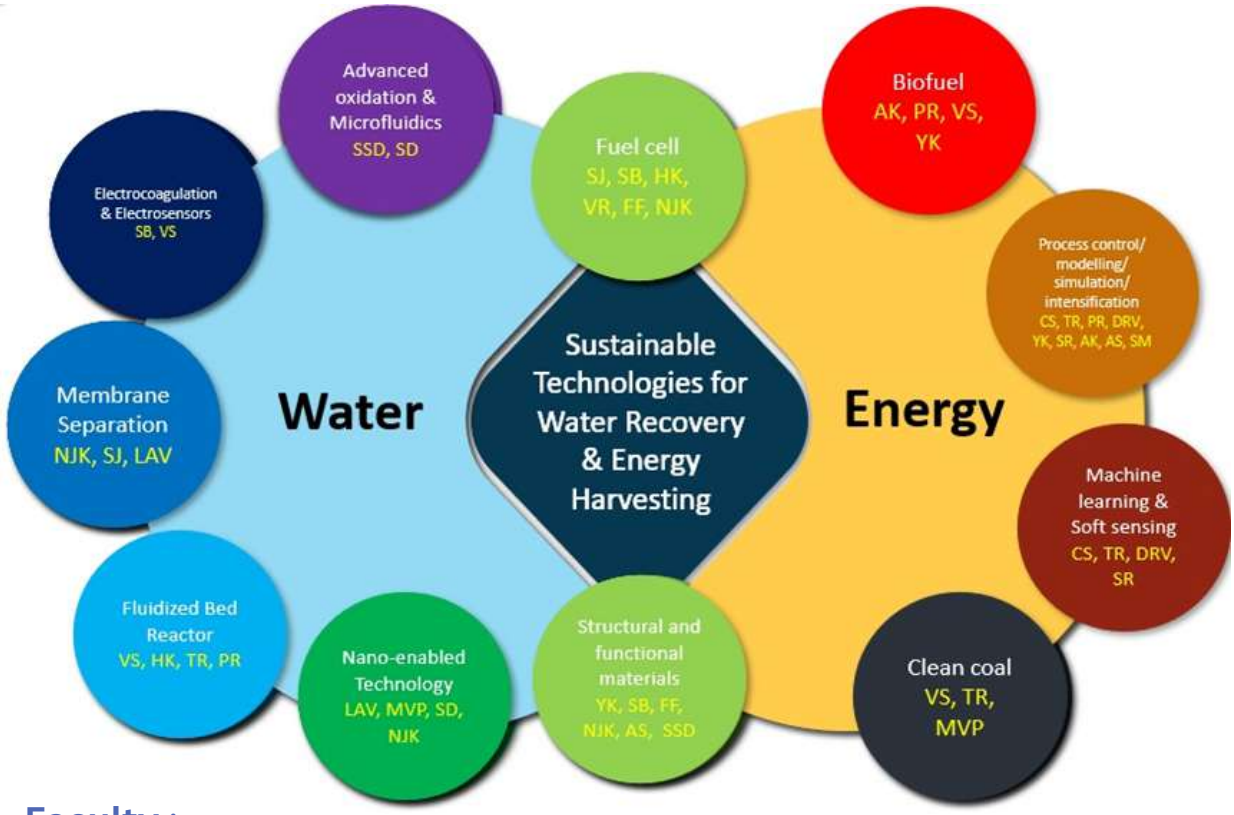
FACULTY DETAILS

S.No	Name	Designation	Specialization
13	Dr. Teja Reddy Vakamalla	Assistant Professor	Experimental and Computational Fluid Dynamics, Mineral Processing, Multiphase Flow Modelling
14	Dr. Susmita Das	Assistant Professor	Soft matter, Fracture, Polymers, Nanotechnology, Environmental Engineering, Microfluidic reactor
15	Dr. Dhanya Ram V	Assistant Professor	Process Control and Dynamics, Process Identification, Modelling and Simulation
16	Dr. Fathima Fasmin	Assistant Professor	Fuel cells, Batteries, Corrosion, Modelling and simulation
17	Dr. P Swapna Reddy	Assistant Professor	Process modelling and simulation, Dynamic control, State estimation
18	Dr. Praveen Kumar G	Assistant Professor	Biofuels, Chemical Reaction Engineering
19	Dr. M. Yogesh Kumar	Assistant Professor	Biochemical engineering, Biomimetic material science, Cellulose nanomaterials, Process and materials modelling, Sustainable process design
20	Dr. Subhasis Mandal	Assistant Professor	Thermodynamic modelling, Hydrate based technology, Modelling and simulation
21	Dr. Aniruddha Sanyal	Assistant Professor	Bluff body flow and convection heat transfer Flow assurance in oil and gas pipelines, Non-Newtonian fluid dynamics and Rheology
22	Dr. Shivanand Kumar Veesam	Assistant Professor	Molecular modelling and simulation, Gas hydrates, Machine Learning
23	Dr. Ahammed Sherief K Y	Assistant Professor	Applied and computational mathematics, modelling simulation and optimization

THRUST RESEARCH AREAS

- Catalysis and Reaction Engineering
- Biochemical and Bioprocess Engineering
- Process Modelling and Simulation
- Computational Fluid Dynamics
- Energy and Electrochemical Engineering
- Material Science and Membrane Technology
- Separation Processes and Water Treatment
- Process Control, Optimization and Systems Engineering
- Computational Polymer Science and Polymer Composites
- Molecular Thermodynamics
- Hydrogen Energy

Research Profile



Faculty :

SJ – Shiny, VS – Sivasubramnaian, LAV – Lity, AK - Aparna, HK - Haribabu, SB – S.Bhuvaneshwari, MVP – Pavan, VR – Vineesh, NJK – Noel, TR – Teja, CS – Chandra, SD – Sudev, PR – Panneer, SSD – Susmita, DRV – Dhanya, SR – Swapna, FF – Fathima, PKG – Praveen, YK – Yogesh, SM – Subhasis, AS – Aniruddha Sanyal, SV- Shivanand Kumar Veesam, ASH-Ahammed Sherief K Y

COLLABORATIONS

- International

- National

SPONSORED RESEARCH PROJECTS

Sl.No.	Project Title	Funding Agency	Amount in ₹	Duration
1	A highly flexible Piezo-tribo nanogenerator based on electrospun PVDF nanofibers containing the modified and decorated carbonaceous nanoparticles for capturing human kinematics	SERB	22,89,500	2018-2021
2	Development of hydrothermal liquefaction of microalgae for production of bio-oil	DST-INSPIRE Faculty	35,00,000	2015-2020
3	Simultaneous removal of organic and inorganic pollutants from wastewater using Bio electrochemical systems	KSCSTE	14,40,000	2017-2021
4	Developing soft sensors for copolymerization monitoring and control based on reaction calorimetry	SERB-ECRA	37,79,600	2018-2021
5	Design modifications of TATA-JK dense medium Cyclone for the efficient separation of middling coal	R&D TATA Steel	9,20,400	2019-2021
6	Microbial Recovery of Biogenic Methane from Coal Rejects with Co2 Sequestration Using Novel Hybrid Geo Photobioreactor and Reclamation of the Site	DST (CLEAN COAL)	17,63,000	2019-2022
7	Development of Biomodified Carbon Paste Electrode for the detection and removal of heavy metals from wastewater	SERB	42,64,000	2019-2022
8	Development of Electrospun Membranes with Graded Hydrophobicity for Membrane Distillation	SERB-SRG	26,40,000	2019-2022

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

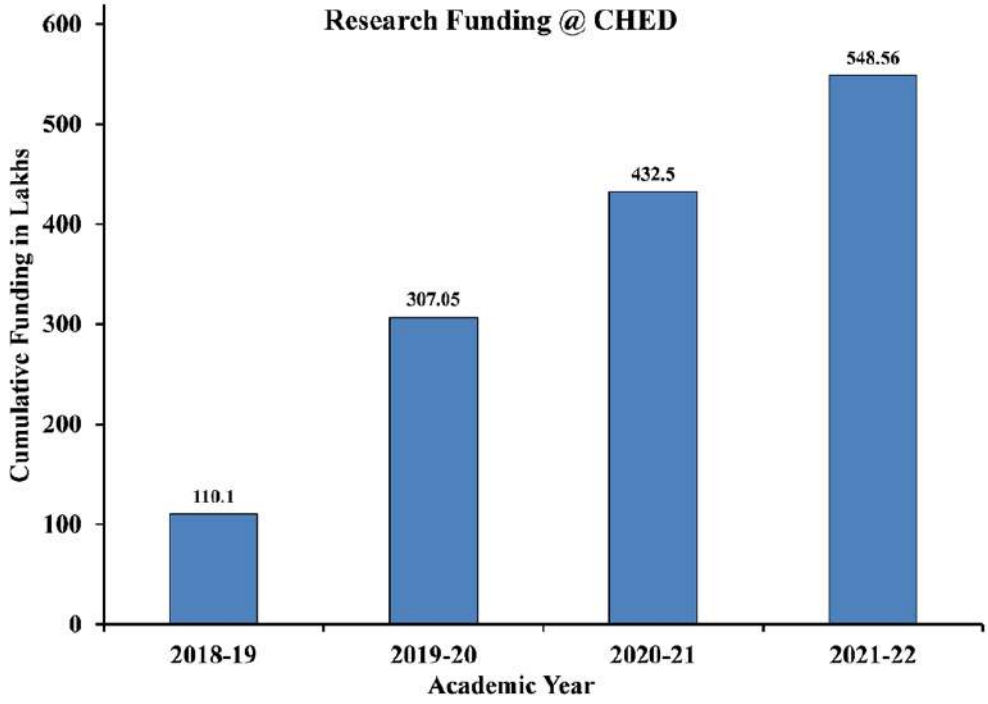
Government of India
Ministry of Human Resource Development

KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT
KSCSTE

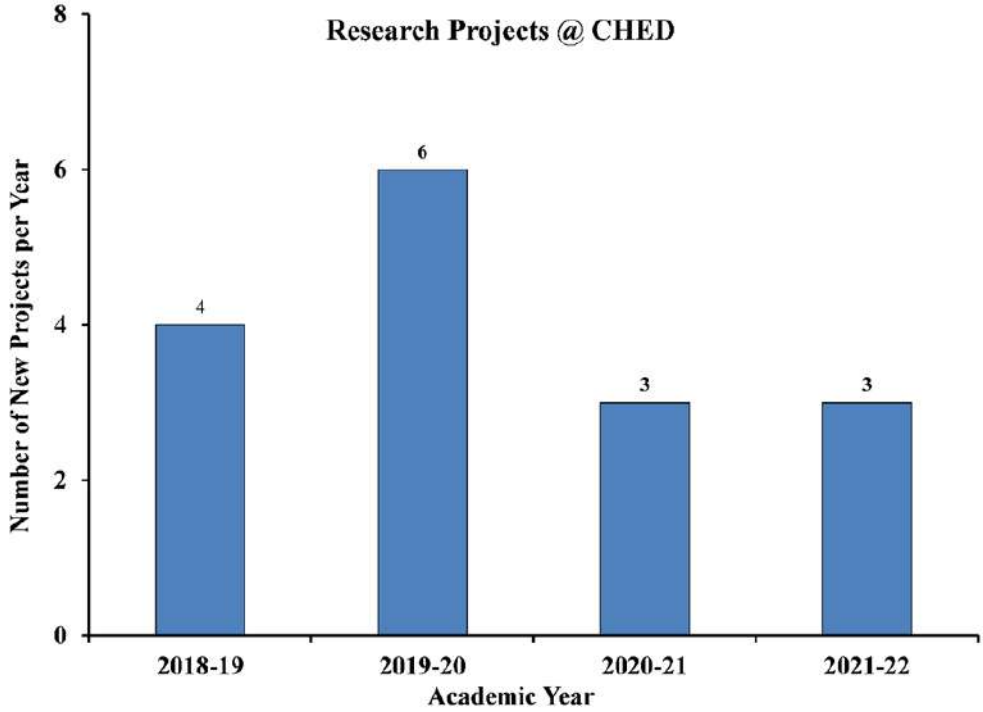
SPONSORED RESEARCH PROJECTS

Sl.No.	Project Title	Funding Agency	Amount in ₹	Duration
9	Tuning the Performance of Thin-Film Composite Membranes on Electrospun Support for Engineered Osmosis in water remediation	MHRD-SPARC	49,89,600	2019-2022
10	Process Intensification of Post Combustion CO2 capture using Rotating Packed bed Reactor concept	SERB-ECRA	30,55,800	2019-2022
11	Study and development of highly efficient multichannel photocatalytic micro/milli reactor for textile waste water treatment exploiting hollow spherical zinc based metal oxide composite	SERB-SRG	20,61,850	2020-2022
12	Integrated hydrodynamic cavitation - membrane distillation technology for enhanced water recovery from industrial effluent	DST (TMD)	21,00,000	2020-2022
13	Field-scale demonstration project to bio-remediate selected polluted stretch of drain/canal in Kerala using a combined engineering approach of aeration, microorganisms and in-drain biofilm blocks	CPCB	83,83,500	2020-22
14	Exploring the effect of Single and Bimetallic-Doped Graphene Oxide (GO) Microporous Architecture by Pool Boiling for High-Quality Steam Generation	SERB, DST	38,30,000	2022-2025
15	Modelling, Simulation and Design of Mg/H2O Sea water Batteries using cost-effective Cathodic Materials	DRDO	9,76,001	2022-2023
16	Sustainable technologies for water recovery and energy harvesting	DST-FIST	68,00,000	2021-2026

SPONSORED RESEARCH PROJECTS



Funding received in Lakhs in the last 4 years

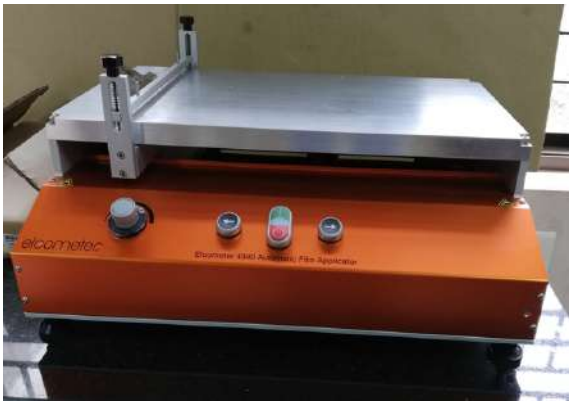


Number of new projects per year

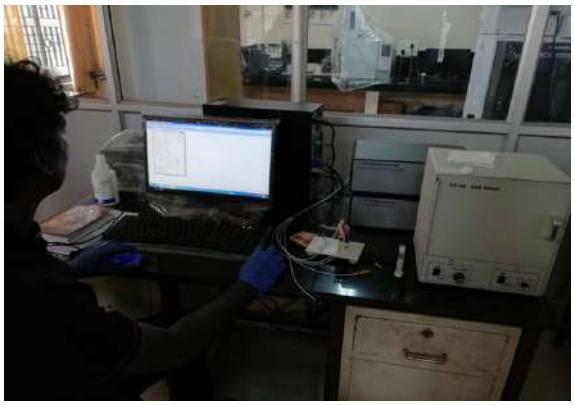
SOPHISTICATED INSTRUMENTS

- Atomic Absorption Spectroscopy
- BET Surface Analyser
- BOD Analyser
- Bomb Calorimeter
- COD Analyser
- Computational Clusters
- Contact Angle Meter
- Digital Multimeter
- Electro Spin Apparatus
- Electrochemical work station
- FTIR-Spectrometer
- Gas Chromatography
- High Performance-Liquid Chromatography
- Hydraulic Pellet Press
- Inductively coupled plasma mass spectrometry (ICP-MS)
- Injection Moulding
- Ion Chromatography
- Microwave Synthesizer
- Rheometer
- Thermal Analyser (TGA/DSC)
- Total Organic Content Analyser
- Turbidity Meter
- Universal Testing Machine
- UV-Vis NIR Spectrophotometer
- Zeta Potential Analyser

High Performance Liquid Chromatography

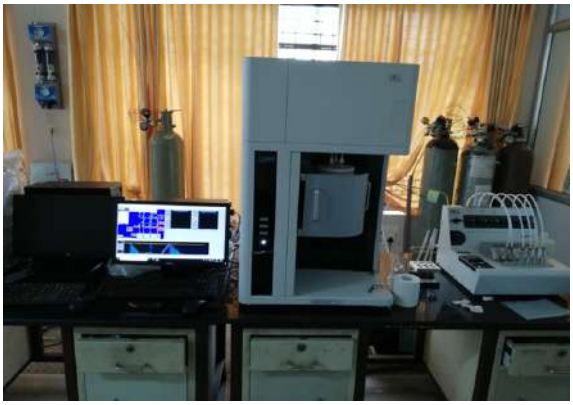


Automatic Film Applicator



Electrochemical Analyzer

FTIR is a spectroscopic analyzer

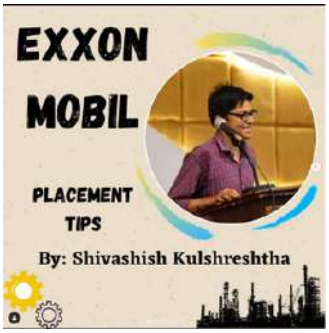


BET Surface Analyser

Thermogravimetry/Differential Thermal Analyzer

STUDENT ACTIVITIES

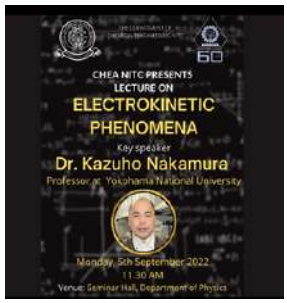
- IIChe student chapter
- Annual technical symposium – DRAV
- Alchemist
- Active participation of students in extracurricular activities such as NCC, NSS, etc.,
- Weekly seminar by Chemical Engineering Association
- Peer mentored learning sessions by Students Guidance Cell
- Participation in National/International conferences/workshops



Placement Talks

Technical Fest

GATE Talks



Talks from Entrepreneurs, Academicians

Alumni Talks

Mentoring Juniors

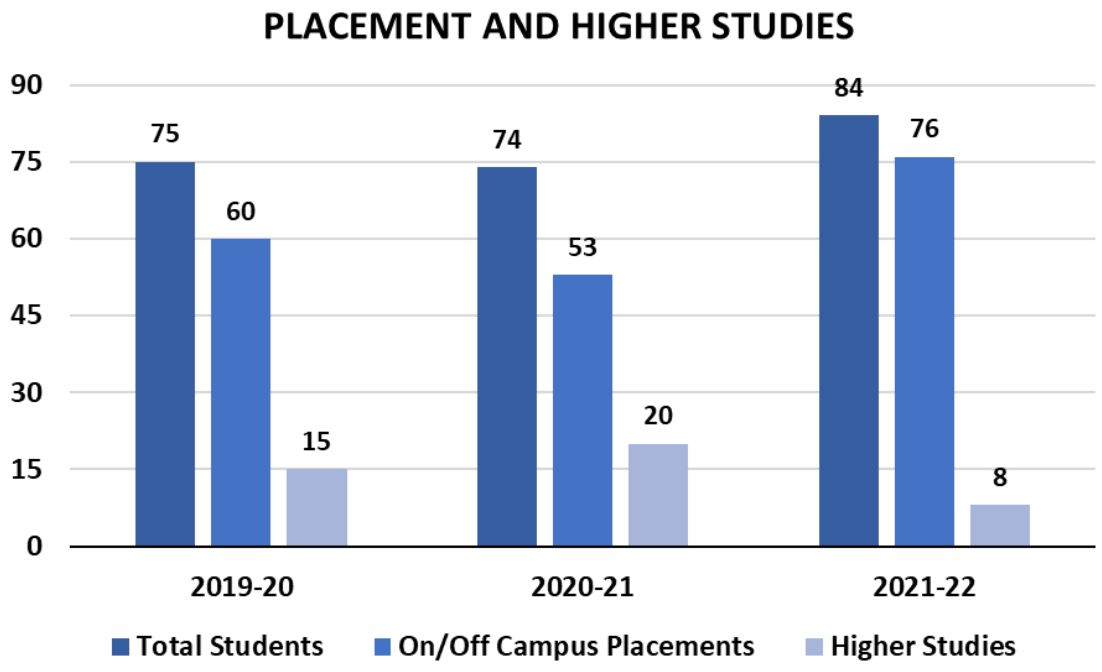
FACULTY ACHIEVEMENTS

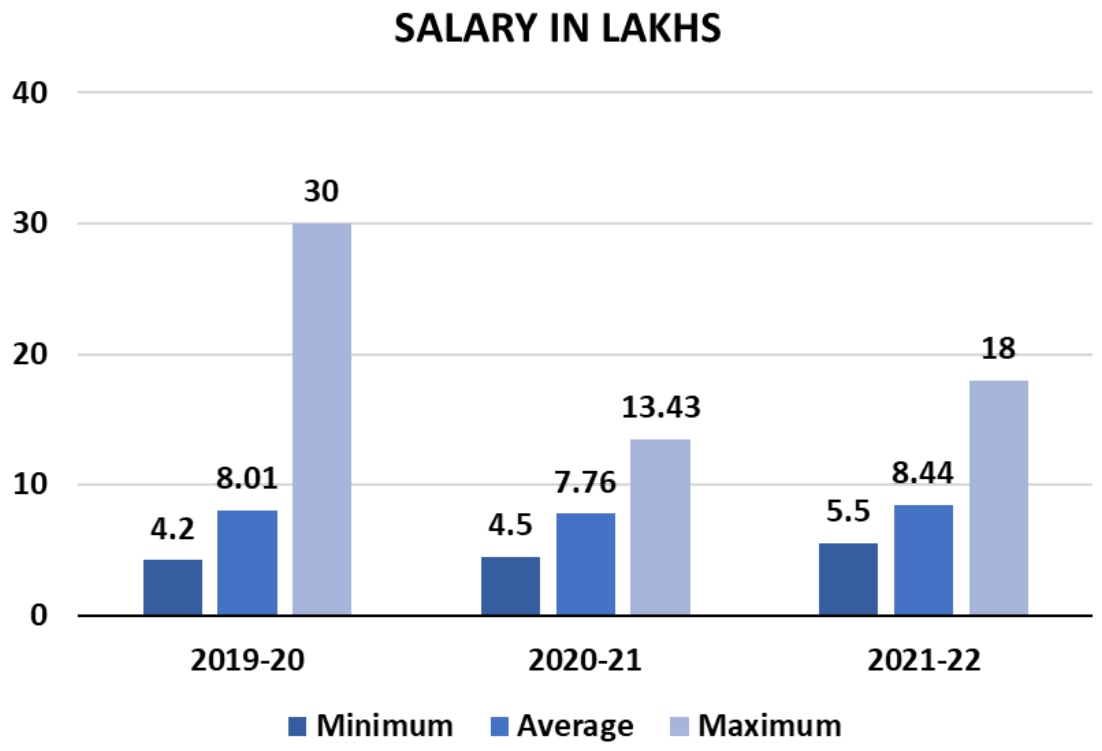
Faculty Name	Achievements
Dr. Susmita Das	• SERB Young Scientist (2015-2018) • Intellectual Ventures Invention Award (IN-810177), 2010
Dr. Noel Jacob Kaleekkal	• Kerala State Young Scientist Award (KSYSA)- 2022 • International Travel Support (ITS) by Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India, 2022. • Young Engineering Award 2022 (Indian National Academy of Engineering) • Early Career Chemist Grant- Pacifichem 2021 – Conference of Pacific Basin Chemical Engineering Societies. Held at Honolulu, Hawaii, USA (online mode) • Technology Transfer Fellowship funded by Center for Technology Development and Transfer, Anna University, Chennai, India; for the project "Mixed Matrix Membranes for Blood Purification Application" • Thermax sponsored BEST MASTERS' THESIS by Association of Separation Scientists and Technologists (ASSET) • Best working model for 'Novel Ultra-filtration membranes for renal failure application during TECHFLUENCE by the Confederation of Indian Industries (CII) & Anna University. 2015
Dr. Teja Reddy Vakamalla	• International Travel Support (ITS) by Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India, 2017. • Research Excellence Award for the years 2014, 2015 in the Department of chemical engineering, IIT Hyderabad. • • Guest Editor, Heat Transfer Engineering (Special volume on ICFTES'22) • Guest Editor, Chemical Engineering and Technology (Special volume on ICFTES'22)

FACULTY ACHIEVEMENTS

Faculty Name	Achievements
Dr. V Sivasubramanian	• Jawaharlal Nehru Gold Medal award for excellence in education and research, Thiruvannamalai, Tamil Nadu, 2014 • Dr. Radhakrishnan Gold Medal award for contribution to education and national development, Thiruvannamalai, Tamil Nadu, 2014 • Universal Achievers Gold Medal award for contribution to education and national development, 11th Unity conference, Salem, Tamil Nadu, 2015. • Rashtriya Gaurav Award by IIFS, New Delhi for the Contribution to Scientific Development & Social Work, 2011 • Managing Guest Editor, Fuel, Elsevier, 2018
Dr. M V Pavan Kumar	• Post-doc Fellowship, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany (2008-10)
Dr. Sudev Das	• Guest Editor, Heat Transfer Engineering (Special volume on ICFTES'22) • Guest Editor, Chemical Engineering and Technology (Special volume on ICFTES'22)
Dr Panneerselvam Ranganathan	• €50,000 for his proposal titled "Development of a lab-scale integrated process for biopropane (Bio-LPG) production from rice straw via fermentation and catalytic hydrothermal decarboxylation", submitted to SHV Energy, the Netherlands, 2022. • Early Career Research Award (ECRA) by DST-SERB (2019-22) • DST INPSIRE Faculty (2015-2020) • Early Career Research Plenary Presentation Award – UKCCSRC, UK, 2013 • Research Fellow at Cranfield University (2013 – 2015) • Post-Doctoral Fellow at TU Delft University of Technology (2009–12)

CAMPUS PLACEMENTS





OUR RECRUITERS

THERMAX
PI Inspired by Science
SRF
mitsogo
udaan
L&T
Deloitte.
ZenSar TECHNOLOGIES
AARTI INDUSTRIES LIMITED
NOVARTIS
TATA ELXSI
BYJU'S The Learning App
CBG
ZS
TATA POWER
Capgemini
ExxonMobil
Phillips Carbon Black Limited
tcs TATA CONSULTANCY SERVICES
NINELEAPS
SOUTH INDIAN Bank
HP
CGI
digité
IMPACT ANALYTICS
iQUANTI
NUVOCO
Knowlvers
Knowledge based solution providers
Think & Learn
accubits
cubastion®
DECiMAL POiNT
Innovative Research Solutions
AUTONINJA
intelliPaat
Reliance Industries Limited
ADITYA BIRLA GROUP
genpact
NCR
HCL TECHNOLOGIES
VEDANTA LIMITED ODISHA
MRF

A FEW DISTINGUISHED ALUMNI

Dr. Snehashis Choudhury
Senior Cell Engineer at Tesla
NIT Calicut 2013 Passout

Dr. Sagar Bharathraj
Samsung Research SSIR Battery Enthusiast
NIT Calicut 2010 Passout

Mr. Santosh K Gurunath
Founder Umagine
Developing Low Carbon Hydrogen Economy
NIT Calicut 2010 Passout

Dr.Anjali Jayakumar
Assistant Professor in Chemical Engineering, Newcastle University, UK
NIT Calicut 2013 Passout

Mr. Sameer Punnapala
Senior Petroleum Engineer at ADNOC Group
NIT Calicut 2010 Passout

Dr. Resmi Suresh
Data scientist - Process modeling at Shell
NIT Calicut 2012 Passout

Mr. Jishnu Jayaraman
Flow Analyst bij ASML
NIT Calicut 2014 Passout

Mrs. Swathy S Kumar (IPS)
Assistant Superintendent of Police
Talcher, Orissa, India
NIT Calicut 2010 Passout

Mr. Manoj Madhav
Indian Foreign Service 2020
NIT Calicut 2016 Passout

Mr. Arun K
Manager R&D HPCL
NIT Calicut 2010 Passout

TESTIMONIALS

NITC Chemical engineering department is extremely helpful in not only enriching my knowledge in the subject but also guide me in my career path. My final year project in NITC has helped me to develop interest in the field of Membrane Technology.
I am currently pursuing Masters by Research in National University of Singapore in the same field.

Yuvaraj Mutharasi
B-Tech in Chemical Engineering (2015-19)
Masters by Research in National University of Singapore

Four years in NITC were the best days for my academic as well as interpersonal growth. CHED had a great role in my overall personality development. Diverse group of students improved my holistic approach to tackle technical issues. Faculties always encouraged me to develop soft skills along with technical skills, which are very much helping in achieving my career goals.

Amit Kumar Singh
B-Tech in Chemical Engineering (2011-15)
Reliance Industries Limited

Department and my batch mates framed my limited worldview though I deviated my career after B.Tech . We enjoyed both college and studies .Department was neither dominating nor interfering or imposing . We could engage and enjoy college activities along with learning and gaining knowledge. I am forever thankful to college department and my chem buddies in building confidence and getting us ready to face the opportunities and challenges of the new World .

Swathy S Kumar
B-Tech in Chemical Engineering (2010-14)
IPS

The Department is already known to have nurtured a generation of industry-ready enthusiastic individuals who have already taken up crucial leadership positions in whatever firm they are working for. Now, it is pushing its boundaries and challenging itself everyday on the research front to produce top notch research scholars who can shape a better tomorrow for all of us.

Dhanush Varun Siddanathi
B-Tech in Chemical Engineering (2017-21)
ZS Associates, Business Operations Associate

TESTIMONIALS

The diverse student body strengthened my interpersonal skills and enhanced my education by exposing me to unique perspectives and out of the box thinking. The department's well-equipped facilities and equipment help students gain the necessary practical expertise to tackle real-world challenges. I greatly appreciate the efforts of the department and faculty to create high caliber individuals capable of confronting the world's problems – be it in industry, corporate, or research.

Sriramani Mangipudi
B-Tech in Chemical Engineering (2018-22)
Process Safety Engineer at ExxonMobil

NITC in general and the department of Chemical Engineering in particular have played a very crucial role in my academic and career trajectory. The campus, the faculties and the department have helped me evolve as an individual of originality, opinion and confidence. The various events in the campus such as Tathva, Ragam and the department's Drav, have helped shape my leadership qualities and team spirit. I therefore wish the campus and the department the very best.

Manoj Madhav S
B-Tech in Chemical Engineering (2012-16)
Indian Foreign Service

My research in Chemical Department using cutting edge technologies facilitated me to explore this diverse field and enhance my research skills. The guidance and support that I received during my research was unparalleled. The interaction with diverse student population is a unique experience in itself.I can confidently say the Department of Chemical Engineering has played a crucial role in shaping my career and provided me an essential push to forge ahead."

Akshay Sundaran
B-Tech in Chemical Engineering (2016-20)
M.S Chemical Engineering at the University of California San Diego

Excellent laboratories, equipment, and infrastructure available helped me a lot in the learning process and becoming an engineer. The coursework is perfectly designed for gaining knowledge and becoming capable of cracking job interviews or competitive exams like GATE. The diversity in ongoing research areas assisted me to explore and find my research interest.

Deepak Narayana Murthy Akundii
B-Tech in Chemical Engineering (2018-22)
PhD, Arizona State University

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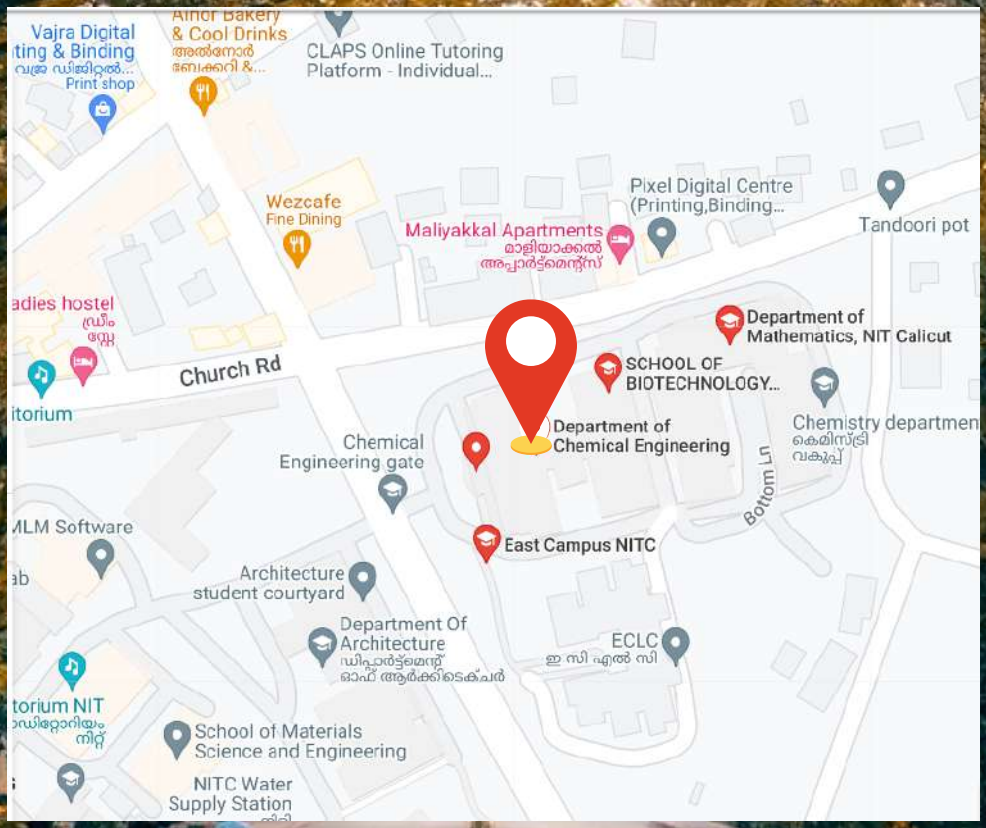

For details contact:

DEPARTMENT OF CHEMICAL ENGINEERING

hodchemical@nitc.ac.in

0495 228 5401