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UPES

UNIVERSITY OF TOMORROW

RESEARCH CENTRES

UPES Environmental Research Center

The Centre for Energy, Environment, and Sustainability Studies (CEESS) at UPES is a distinguished think tank and research center within the School of Business. Its primary aim is to promote multidisciplinary research in areas such as economics, environment, energy, globalization, trade, transport, supply chain, and sustainable development. https://research.upes.ac.in/centre-for-energy-environment-and-sustainability-studies-ceess/

Centre for Energy, Environment, and Sustainability Studies (CEESS) is a constituent think tank and research centre of excellence of School of Business, UPES. Its primary aim is to promote multidisciplinary research in areas of Economics, Environment, Energy, Globalization, Trade, Transport, Supply chain and Sustainable Development. Considering the Environmental policies of the country against thriving energy requirement and demand for infrastructure development in achieving high economic growth needs a balanced approach that can be derived from informed and effective research and development. Given what has been said, CEESS will be a major player to suggest policy reforms, as a result of its R&D that will help the policymakers to achieve sustainable development goals. Along with the vision of "Make in India" and "Atmanirbhar Bharat Abhiyan", CEESS through its research and publication will assist policymakers to design their policies towards self-dependence, generation of employment and increasing value-addition with new initiatives to support both the manufacturing and services sectors and improving the 'ease of doing business' in the country.

The centre will promote research on issues pertaining to the economy, energy, environment, and society in the context of trade, transport and globalization with a specific focus on sustainable development. Centre will help suggest strategies for the implementation of energy, environmental and economic policies through R&D that will help policymakers to design effective policies for the country and the rest of the world.

BROAD RESEARCH THEMES

- The broad themes that will be primary areas of research at CEESS are:
- Energy Business: Renewable and Non-renewable energy business
- Business and Sustainable Development
- Environmental Economics and Energy
- Climate Change Economics and Policy
- Economics and Business Studies
- Transportation and Green Supply Chain Management
- Trade, Environment and Globalization
- Marketing Management and Energy Business
- Public Policy and Governance

FUNCTIONS OF THE CENTRE

- To promote Research and Development

• To promote international and national research collaborations

• To promote to submit joint funded research proposals

• To promote interdisciplinary and multidisciplinary research

• To conduct research workshops, seminars, conference, panel discussions, and guest/distinguished lectures

• To help in disseminating research output through publication, workshop, seminar etc.

• Building a network with industry, research think tank, ministry at the national and international level for joint research collaboration and funding.

Significance of CEESS in Promoting Sustainability:

- **Policy Advocacy:**

CEESS conducts informed research to suggest policy reforms that assist policymakers in achieving sustainable development goals. This aligns with national initiatives like "Make in India" and "Atmanirbhar Bharat Abhiyan," focusing on self-dependence, employment generation, and enhancing value addition in both manufacturing and services sectors.

- **Research Promotion:**

The center fosters research on issues related to the economy, energy, environment, and society within the context of trade, transport, and globalization, with a specific focus on sustainable development. It suggests strategies for implementing energy, environmental, and economic policies through R&D, aiding policymakers in designing effective policies both nationally and globally.

- **Collaborative Initiatives:**

CEESS promotes international and national research collaborations, submission of joint funded research proposals, and interdisciplinary studies. It organizes research workshops, seminars, conferences, panel discussions, and distinguished lectures to disseminate research outputs.

Impact on UPES University:

- **Academic Enrichment:**

By integrating sustainability studies into its research framework, CEESS enhances the academic environment at UPES, providing students and faculty with opportunities to engage in cutting-edge research on critical global issues.

- **Industry Engagement:**

The center builds networks with industry, research think tanks, and ministries at both national and international levels for joint research collaboration and funding, positioning UPES as a hub for impactful research and policy development.

- **Sustainability Leadership:**

CEESS's initiatives contribute to UPES's commitment to sustainable development, aligning with various Sustainable Development Goals (SDGs) and reinforcing the university's role as a leader in promoting environmental stewardship and sustainable practices.

In summary, CEESS plays a pivotal role in advancing sustainability at UPES by fostering multidisciplinary research, influencing policy reforms, and promoting collaborative initiatives that address pressing environmental and economic challenges.

1. **Centre for Interdisciplinary Research and Innovation (CIDRI)**

https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

Centre of Inter-disciplinary Research & Innovation (CIDRI) at UPES provides a platform for interaction across the boundaries of various disciplines, such as Science, Engineering, Health Environment, Computer Science, Design, Management, Humanities, Law, etc. and address the key technical, organisational and logistical challenges that currently hinder truly trans disciplinary research. CIDRI promotes and facilitates the interfacing and collaborating with industries, clinicians and doctors in hospitals for translational research, research groups of prominent national and international universities/institutes. CIDRI aims at bringing together the researchers in the field of basic sciences, all streams of engineering, artificial intelligence, machine learning along with experts of design as well as business and law so as to finally emerge with a product with intellectual property rights and business plan

2. **Central Instrumentation Centre (CIC)**

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Central Instrumentation Centre (CIC) was inaugurated by “Padma Bhushan Dr. R. Chidambaram” on 27th February 2014. This facility is aimed to provide data collection from sophisticated, analytical equipment to scientific community for their advanced research and also to facilitate cutting edge technologies for societal needs. The facility is open to researchers from across the country.

3. **Centre of Alternative Energy Research (CAER)**

https://upes-production-cvb3e7frghdda0a4.z01.azurefd.net/drupal-data/2024-02/UPES-2022-23-Annual-Report_new_0.pdf

https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

Providing safe, widespread, and equitable access to sustainable energy is one of the key challenges of our time. Centre for Alternate Energy Research (CAER) UPES, hosts world-leading researchers who see this challenge as an opportunity to help future generations inherit a better world. Our interdisciplinary program brings together innovators from many departments, including the School of Applied Science, School of Engineering, School of Health Sciences and School of Business. Work is in progress on different alternative energy resources using advanced technology. Current efforts include biofuel production from waste agricultural and forest biomass by thermal and biological routes, plastic waste to energy and other value-added products, microalgae biofuels. CAER actively seek national and global collaboration with industry, academia and all levels of government and private bodies.

List of Equipment at CAER

Solar Thermal Pyrolysis Reactor (15 Kg/Batch)	Pour And Cloud Point Apparatus
Digital Pyrolysis Reactor (100 G/Batch)	Bomb Calorimeter
Digital Pyrolysis Reactor (50 Kg/Batch)	Gas Chromatograph With TCD And FID
Municipal Solid Waste Segregator	Hot Air Oven
Plastic Shredder Machine	Muffle Furnace
Floating Type Biogas Production Plant (6 M^3/ Day)	Vacuum Oven
Floating Type Biogas Production Plant With Biogas Engine Set Up (80 M^3/Day)	Weighing Machine (100 Kg)
CSTR Biogas Plant (40 M^3/Day)	Weighing Machine (0.001 G)
Gasification Reactor (Downdraft Gasifier, 20 Kg/Batch)	Ultrasonic Interferometer
Briquetting Machine	Hot Plate Magnetic Stirrer
Screw Press Expeller	Heating Mantle
Lab Scale Biodiesel Reactor (1L/Batch)	Solar Cooker
Biodiesel Reactor (5L/Batch)	Chirpine Grinder
Biodiesel Production Plant (100L/Batch)	Refrigerator
Fermenter	Centrifuge
Algae Photo Bioreactor	Scheffler Dish
Open Raceway Ponds	Fuel Combustion and Emissions Analysis Set Up
Soxhlet Extraction Unit	Distillation Assembly
Hydrothermal Liquefaction Reactor	Fixed Bed Reactor (Gas To Liquid Production Technology)
Viscometer	Multi Fuel Cooking Stove (NEELAM Cooking Stove)
Density Meter	

Moreover, UPES have more research center fostering sustainability, these esteemed centers and institutes are deeply committed to sustainability through their unique research and initiatives.

The Himalayan Institute for Learning and Leadership fosters sustainable development by promoting leadership programs that emphasize eco-friendly practices and social responsibility. The Centre for Research on Microbiomes of Uttara hand works towards understanding the vital role of microorganisms in maintaining ecosystem health, supporting biodiversity, and ensuring sustainable agriculture in the region. Similarly, the Centre for Ayurveda Research: A Quest for the Nobel Prize merges traditional knowledge with modern science, exploring sustainable healthcare solutions through natural remedies and practices. The Centre for Energy, Environment, and Sustainable Studies is dedicated to advancing renewable energy solutions, minimizing environmental footprints, and promoting sustainable living. Lastly, the Center for RISE (Research on Impact, Sustainability, and ESG) focuses on developing frameworks and strategies to integrate sustainability, environmental protection, and social governance into business models, contributing to long-term sustainable

development. Collectively, these centers exemplify a holistic approach to sustainability, addressing environmental, social, and economic challenges.

4. **Machine Intelligence Research Centre (MIRC)**

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The facility is aimed at conducting high-end computing specific to investing Machine Learning challenges of Artificial Intelligence. The facility is funded by Research & Development of UPES, in collaboration with School of Computer Science (SOCS) having a vision to develop as Centre of Excellence (COE) that is profound and self-sustainable. MIRC facility is equipped with HPE Apollo6000 Gen 10 server system, having 256 GBs of RAM and dual Xeon processors installed over 32 GB of GPU Tesla V100 graphic card. MIRC provides platform for researchers, all faculty and students to conduct fundamental research in the field of Artificial Intelligence and Data Sciences. It also provides assistance and collaborates with other schools of the university and related organisations for applied AI work. MIRC facilitates the heavy and parallel computing for other fields like Fluid Dynamics, Virtual Reality, and simulation for Aerodynamics. The centre is utilised by students of doctoral studies, post and under graduate along with faculty members. Over the coming few years, the centre is expected to be strengthened with increased computational capacities and other infrastructure.

5. **Hill: The Himalayan Institute for Learning and Leadership**

https://www.upes.ac.in/hill

https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

HILL, the Himalayan Institute for Learning and Leadership, is dedicated to fostering sustainable solutions for the complex challenges faced in the Himalayan region. By promoting collaboration between academia, R&D institutions, and local communities, HILL aims to drive innovative solutions that address both local and global issues. Through a blend of cutting-edge research, capacity-building initiatives, and effective knowledge sharing, HILL seeks to empower communities and support the sustainable management of natural resources. Our approach integrates advanced technological interventions with a deep respect for the region's unique socio-economic and ecological context.

Aligned with our mission to balance economic growth, cultural preservation, and environmental conservation, HILL is committed to strengthening society in the Himalayan region. We focus on facilitating collaborative research and innovation to tackle pressing challenges, while also supporting the sustainable development of the region's assets through targeted studies and interventions. By building local capacity and fostering a culture of continuous learning, we aim to create a harmonious balance between progress and preservation, ensuring a resilient and thriving future for the Himalayan region.

Objectives

- Develop strategies and initiatives that simultaneously promote economic growth, cultural preservation, and environmental conservation in the Himalayan region.
- Capacity building initiatives to empower communities, enhancing their skills and knowledge for sustainable development.
- Foster partnerships among local, regional, and international institutions to address pressing local and global challenges through innovative research and solutions.
- To promote community self-reliance through technological interventions for the sustainable management and utilization of natural resources.

Our Vision

HILL aims to achieve sustainable solutions for the challenges in the Himalayan region by fostering collaboration between academia, R&D institutions, and society through innovative solutions, capacity-building initiatives, and knowledge sharing.

Our Mission

Strengthening society to balance economic growth, cultural preservation, and environmental conservation in the Himalayan region. Facilitate collaborative research and innovation to address local and global challenges. To support the sustainable development of the socio-economic and ecological assets of the Himalayan Region through innovative studies and knowledge interventions. Empowering society through capacity-building initiatives

Disaster management and mitigation

- Forest Fires
- Landslides
- Flash floods
- Avalanches
- Earthquake
- Glacial lake outburst floods (GLOFs)
- Riverbank Pollution

Sustainable promotion for

- Synergy of Yoga and Modern Sciences
- Spirituality in Modern Culture
- Agricultural production
- Human & Wildlife interactions
- Linking villages to city to
- minimize the migration
- Optimization of uses of natural resources
- Preservation of heritage

6. <u>Waste Paper Recycling Laboratory</u>

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Primarily focus of this Research Laboratory is on waste paper recycling. Its rationale stems mainly from the fact that the world's consumption of paper products is massive and therefore the disposal problems are enormous; traditionally involving either incineration or landfill. Our basic idea was to bring a balance between the environment and the use of technology for the economic independence of rural women. This project aimed to help rural women from the indigenous community to earn a fair wage by teaching them how to make high-quality goods using waste paper viz paper pencils, jewellery, stationery items, etc. In a lab, we have a set of six machines.

7. Medicinal Plant and Aromatic Plant (MAP) Lab

https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

The Medicinal and Aromatic Plant Laboratory is developed under DST funded project Rural Women Technology Park of UPES, (2015-2018) SEED Division DST, GoI. The objective of the lab is to do Extraction of essential oil of medicinal and aromatic plants and to conduct comparative study of yield of essential oil from different land pattern. Under this Lab the primary screening of natural compounds from medicinal and aromatic plant is carried out. MAP Lab facilitates the antimicrobial, antifungal, and antibacterial studies of extraction of MAP species. The lab is equipped with Soxhlet assembly, Rotameters, Clevenger unit and Steam distillation (Autoclave)unit, soil and water testing kits which are used for the extraction of essential oil of Lemongrass, Stevia, Tulsi and Chamomile. The University has also established polyhouse and nurseries for the cultivation of medicinal and aromatic plants. Under this project, we give training and technical backup support to rural women farmers to cultivate medicinal and aromatic plant species like Tulsi, Chamomile, Lemongrass, Stevia in nearby villages i.e Than goan, Birsani, Doonga and Masraajpatti.

List of equipment at MAP

Clevenger Apparatus	Digital pH meter Water
Soxhlet Assembly	Bath Digital
Steam Distillation Unit (Autoclave)	Desiccator
Rota Vapour	Weighing Balance
Portable Water Testing and Soil Testing Kit	Poly House
Digital Heat Mantle	

8. Speech and Language Research Centre (SLRC)

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The objective of Centre of Excellence in Speech and Language Research Centre (SLRC) is to undertake theoretical and empirical research into the rich and complex structure of physiological, social and development variation. Our lab efforts are to root a community-based solution by improving language understanding and developing target intervention for their speech and language weaknesses. Through our research we want to cater families, educators, community people and policy makers so that they can recognise their role and responsibilities in facilitating speech, or language development.

9. **Centre for Data Science and Artificial Intelligence (C-DSAI)**

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C-DSAI at UPES is established to contribute towards the growing significance of the role of Data Science, AI, and AI-enabled technologies in various application domains. These technologies are omnipresent today in society and business world. All areas of life are affected by digital transformation which is evolving faster and faster. Data Science, AI, 5G, Big Data, IoT, and Blockchain will disrupt traditional business models and change job roles in industry. Organizations that fail to recognise the disruptive power, will be left behind.

10. **Centre for Stochastic Modeling and Simulation (CSMS)**
    https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

    With growing realisation that mathematics has become a central feature of scientific enquiry, attempts would be made to model different systems. Most practical systems have uncertainty/stochasticity associated with them. Real world systems whether physical, engineering, neural, biological, health, educational, environmental, social and managerial are inherently nonlinear and stochastic. The centre aims to focus on the development of application-driven theories and methodologies for understanding uncertainty and its management.

11. **Early Science Technology Engineering Education & Mathematics (ESTEEM) of India Research Centre**

https://www.upes.ac.in/research/research-and-innovation-facilities-institutes-and-centres

ESTEEM of India Research Centre has a four-pronged focus: Mathematics and Astronomy of India, Mensuration in IKS, Chemistry of dyes, pigments, chemicals used in India & Sustainable agriculture and food preservation. The ESTEEM of India Research Centre aims to bring to the fore, the rich scientific traditions of India through various forums and actual demonstration of the concepts described in the Indian traditions – with an earnest motivation that an exposure to such knowledge may infuse the coming generation of students and scholars with a rich knowledge and understanding of India and may pave the path for a renewed intellectual resurgence of India at the global level. It will also strive hard to question (and set right) the Eurocentric version of history of science and will highlight India's pre-eminent contributions to the field of Science and Technology. This Research Centre, under the leadership of Dr. Ashish Karn has already fetched two research grants, one from IKS division, Ministry of Education and one with the collaboration of SoA University, Bhubaneshwar. The Research Centre has crafted many student researchers to present their works at topmost IKS forums in the country. The Research Centre has also been actively involved in the dissemination of IKS inside and outside UPES through seminars and invited talks. Finally, the work of the Centre has also led to a course being taught at UPES since last year titled "Indian Knowledge Systems in Science and Engineering".

12. **ASCE Student Chapter, UPES: American Society of Civil Engineers Student Chapter at UPES**

https://www.linkedin.com/in/asce-student-chapter-upes-0b88321b2/?originalSubdomain=in

Our Mission

At ASCE-UPES, our mission is to nurture and empower the future leaders of civil engineering. We are committed to fostering excellence, innovation, and sustainability within the field. Our student chapter serves as a platform for aspiring engineers to explore, learn, and contribute to the ever-evolving world of civil engineering.

What We Stand For

We believe in engineering with a purpose. Our commitment to sustainable practices and eco-friendly solutions drives our initiatives. We are dedicated to building a brighter, greener future through the power of civil engineering.

Join Our Community

By connecting with us on this platform, you'll stay updated on our activities, events, workshops, and more. Network with like-minded individuals, industry experts, and discover opportunities that can shape your engineering journey.

Knowledge and Growth

ASCE-UPES is more than just a student chapter, it's a family of passionate learners and doers. We are here to enhance your skills, broaden your horizons, and support your professional growth.

Get Involved

Whether you're a student looking to expand your knowledge, a professional seeking to share your insights, or a company interested in collaboration, there's a place for you in the ASCE-UPES community. Let's build a future where civil engineering knows no bounds.

13. **UPES AAPG Student Chapter**

https://www.instagram.com/upesaapg/

One of the premier student chapters for aspiring Petroleum & Earth Sciences engineers of University of Petroleum and Energy Studies Dehradun, India.

14. **UPES ASSP Student Section**

https://www.linkedin.com/company/upes-assp-student-section/posts/?feedView=all

The Official page of UPES ASSP Student Section under Department of Health Safety Environment & Civil Engineering, UPES.