



UPL UNIVERSITY
OF
SUSTAINABLE TECHNOLOGY



Kathan
ज्ञानम् यजामहे।

KATHAN

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15

YEARS OF GLORY

SINCE 2011





VISION



To nurture ethically skilled students for better contribution to the industry, business and the upliftment of society.

To develop knowledgeable and professionally competent engineers to meet global challenges .



MISSION

To provide an environment of academic excellence in Engineering and Technology through complete dedication to all round growth of students and develop sustainable solutions.



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Mr. Ashok A. Panjwani, President, ARES

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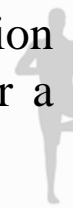

Dr. Prakash Majee (Assistant Professor, ISR)



Editorial message

E-news magazine KATHAN is one of the best platforms for our students to present multifaceted personalities and innovative ideas. Our magazine is a balanced collection of technical and literary activities sports and cultural activities, poems, stories, academic achievement, etc.

In this era of technological advancements, it is still imperative for us to keep ourselves abreast of Technological advancements and yet be grounded enough to think and act like humans. The views, ideas and dreams put forward by our students are sure to be the expressions of technocrats who will work in the best interest of our society and nation at large. The articles of this issue reassures that there is hope for a better tomorrow which will soon be a reality.



Student Editors



Yash Jadav
BE-8th Sem
EST

Meet Rathod
BE-8th Sem
CT



Kaushil Mehta
BE-8th Sem
CT

Dev Joshi
BE-8th Sem
EE



Gagandeep Dighal
BE-4th Sem
CO

Dev Patel
BE-8th Sem
ME



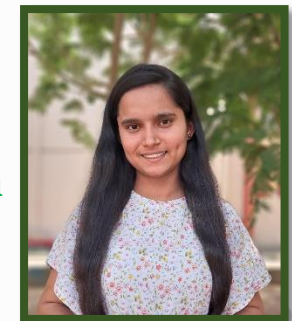
Krishna Joshi
DE-4th Sem
EE

Jeet Parmar
B.Sc-4th Sem
ISR



Dipali Patel
BE-8th Sem
CE

Nisha Pandey
M.Sc-2nd Sem
ISR





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15th Founder's Day

The 15th Founder's Day of UPL University of Sustainable Technology was celebrated with great enthusiasm and reverence, marking 15 years of the institution's dedication to sustainable education and innovation. The event commenced with a grand cake cutting ceremony at 10:00 am at the Administration Office, led by the Honorable President, Mr. Ashok Panjwani. The celebration began at Seminar Hall One, where guests were warmly welcomed, and a commemorative video was played showcasing highlights from the university's journey over the past 15 years.

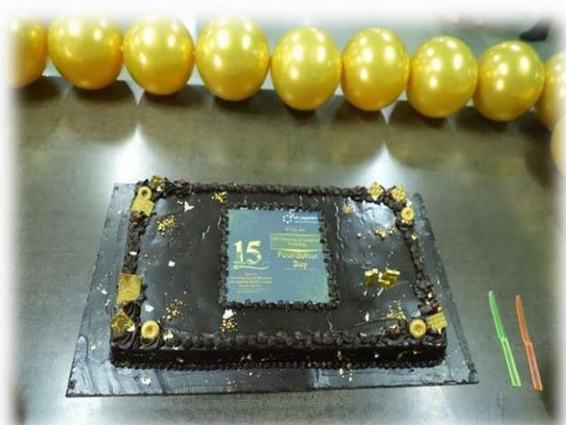
The event was graced by the esteemed presence of President Mr. Ashok Panjwani, Provost Dr. Shrikant J. Wagh, Registrar Mr. Dharmesh Patel, Deans, and Heads of Departments, Faculty Members, Staff, Alumni, and students.



15th Founder's Day

A series of memorable speeches were delivered, including addresses by Dr. Shrikant J. Wagh and Mr. Ashok Panjwani, reflecting on the institution's progress and vision. Dr. Kunal Suthar, speaking on behalf of all HODs, and Dr. Snehal Lokhandwala, representing the deans, offered thoughtful reflections on academic excellence and institutional values. Dr. Purvi Naik, Controller of Exams, acknowledged the contributions of faculty and staff. Alumni from the first batch of SRICT shared heartfelt memories and appreciation for the university's role in shaping their careers.

Certificates were distributed recognizing and celebrating the achievements of outstanding students. The celebration concluded with a vote of thanks, expressing sincere appreciation to all dignitaries, organizers, and participants. The event not only honored the legacy of UPL University but also fostered a strong sense of pride, unity, and renewed commitment to its mission. Our heartfelt thanks go out to the organizing committee, volunteers, faculty, staff, and alumni for making this celebration a grand success.



15th Founder's Day

As part of the 15th Founder's Day celebration on 17th July 2025 UPL University of Sustainable Technology, a special event was held to inaugurate the newly installed lift facility on the ground floor.

The inauguration began with a traditional "Kanku tilak and nariyal breaking ceremony", symbolizing an auspicious start in accordance with Indian custom.

The formal ribbon cutting was performed by Mr. Arvind Agrawal, Former IAS Officer, in the esteemed presence of Mr. V. K. Madhav Mohan, Growth, Leadership & Management Mentor, President Mr. Ashok Panjwani, Provost Dr. Shrikant J. Wagh, Registrar Mr. Dharmesh Patel along with all Deans, Heads of Departments, faculty members, students, and staff. The lift inauguration not only marked a step forward in improving university infrastructure but also reflected UPL University's commitment to accessibility and development. The event was filled with enthusiasm.



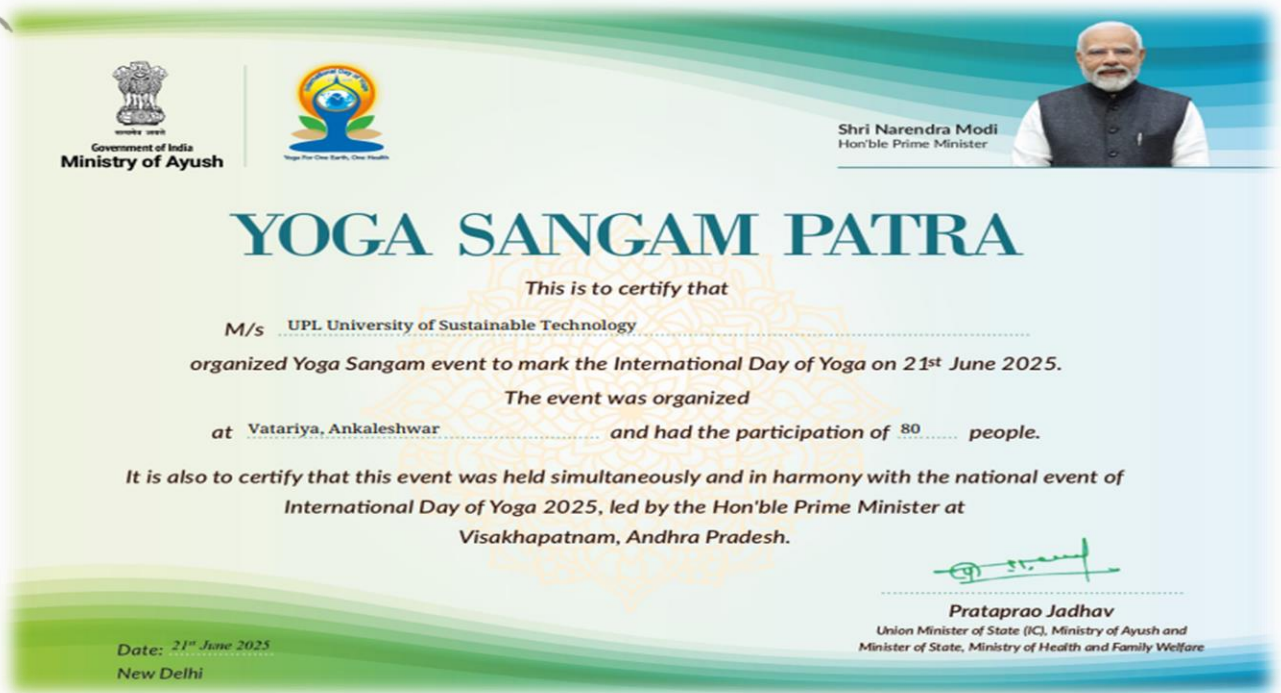
Yoga Day-2025

As part of the nationwide initiative by the Government of India, UPL University of Sustainable Technology proudly celebrated the 11th International Day of Yoga on 21st June 2025, under the Yoga Sangam campaign of #IDY2025. The event was organised by Mr. Parasmal Jain, Sports & Cultural Coordinator, and led by Ms. Rinkal Gajjar, Yoga Master and Gold Medalist of the World Yoga Cup. Students participated enthusiastically, along with faculty members, staff, HoDs, the Deans, and the Registrar. The program featured the Common Yoga Protocol, Surya Namaskar with mantras, breathing and meditation sessions, and an oath-taking ceremony themed “One Earth, One Health.” The event was further strengthened by the active involvement of NCC cadets, who contributed with discipline and coordination. Photos and event details were uploaded to the official Government of India portal.



Yoga Day-2025

In recognition of this successful event, the university received an official Yoga Sangam Patra certificate from the Ministry of AYUSH, Government of India. The event was held simultaneously and in harmony with the national-level celebration led by the Honorable Prime Minister **Shri Narendra Modi** at Visakhapatnam, Andhra Pradesh. Special thanks to the Provost, Registrar, Deans, NCC Cadets, and Ms. Rinkal Gajjar for their inspiring presence and support, which helped make this spiritually enriching and health-focused celebration a remarkable success.





Technical Article

Agricultural Waste to Bioenergy: A Circular Solution

What is Agricultural Bioenergy?

Agricultural bioenergy refers to the energy derived from organic residues and waste left behind after crop harvesting or food processing. This includes:

- Crop residues (wheat straw, rice husk, corn stalks)
- Bagasse from sugar mills
- Fruit peels and pulp from agro-industries
- Cattle manure and poultry litter

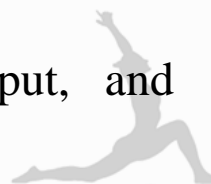
These materials can be converted into various biofuels and energy forms like biogas, bioethanol, biodiesel, bio char, and electricity.

How It Works – The Technologies Involved

1. Anaerobic Digestion: Microorganisms break down organic waste in oxygen-free conditions to produce biogas (a mixture of methane and CO_2).
2. Fermentation: Agricultural starches and sugars are converted into bioethanol using yeast.
3. Pyrolysis: Thermal decomposition in absence of air produces bio-oil and biochar.
4. Gasification: Converts biomass into syngas ($\text{CO} + \text{H}_2$) which can generate electricity or Liquid fuels.

Benefits of Converting Agro-Waste to Bioenergy

1. burning Environmental Protection – Reduces of crop residues, lowering CO_2 , CH_4 , and $\text{PM}_{2.5}$ emissions.
2. Energy Access – Provides decentralized energy in rural areas.
3. Rural Employment – Encourages small-scale biogas or ethanol plants near farms.
4. Circular Economy – Waste becomes a valuable input, and byproducts like digestate can be used as fertilizers.



Technical Article

India's Push Toward Agricultural Bioenergy

India has launched major schemes to promote agri-waste valorization: SATAT (Sustainable Alternative Towards Affordable Transportation): Promotes production of compressed biogas (CBG) from agri and organic waste.

2G Ethanol Policy: Encourages production of second-generation ethanol from non-edible crop residues.

National Bio-Energy Mission: Supports renewable energy from biomass, especially in rural areas. Many pilot projects in states like Punjab, Haryana, and Gujarat have already demonstrated successful models using rice straw and cotton stalks.

Barriers to Overcome

Technological Gaps – Efficient conversion and pretreatment technologies are still evolving. Infrastructure – Need for collection, segregation, and storage systems for agri-waste. Farmer Awareness – Limited knowledge about commercial uses of agri-waste. High Initial Cost – Small farmers lack capital to invest in bioenergy systems.

Conclusion

Agricultural waste is no longer just a disposal problem—it's a renewable energy treasure. With supportive policy, awareness, and technology, India can turn its agri-waste challenge into a clean energy revolution. As future chemical engineers, let's be the innovators who design waste-to-energy plants, develop eco-friendly fuels, and promote rural bio-economies for a better, circular tomorrow.



Machhi Krutik Manishbhai
220101101030
BE CE Sem-3
Chemical Engineerng



Technical Article

Biofuels

What Are Biofuels from Waste?

Biofuels are renewable energy sources derived from biological materials. While traditional biofuels use crops like corn or sugarcane, waste-based biofuels are produced from agricultural residues, food waste, municipal solid waste, sewage sludge, and even used cooking oil. This not only diverts waste from landfills but also provides cleaner-burning fuels like bioethanol, biodiesel, and biogas.

The Science Behind It

The production of waste-based biofuels involves several chemical and biological processes:

Pretreatment – To break down tough structures like lignin in biomass (especially agricultural residues).

Hydrolysis – Enzymes or acids convert complex carbohydrates into simple sugars.

Fermentation or Anaerobic Digestion – Microorganisms convert sugars into ethanol or organic matter into methane (biogas).

Transesterification – Converts used cooking oil or fats into biodiesel using alcohol and a catalyst.

Benefits of Waste-to-Biofuel Technologies

- ✓ **Reduces Greenhouse Gas Emissions** – Biofuels are carbon-neutral or even carbon-negative in some cases.
- ✓ **Minimizes Waste** – Reduces burden on landfills and incinerators.
- ✓ **Energy Security** – Less dependence on imported fossil fuels.
- ✓ **Rural Empowerment** – Farmers and small industries can benefit from agricultural waste valorization.

Industrial Trends and Indian Perspective

India generates millions of tonnes of crop waste annually—much of which is burnt, contributing to air pollution. Converting this to bioethanol or biogas is a cleaner alternative.

Technical Article

Projects like SATAT (Sustainable Alternative Towards Affordable Transportation) aim to promote compressed biogas (CBG) production from waste.

Companies like Praj Industries, IOCL, and HPCL are already investing in 2G ethanol plants based on agricultural residues like rice straw and bamboo.

Challenges to Overcome

- Technology Cost – Advanced processes like enzymatic hydrolysis can be expensive.
- Collection Logistics – Segregating and transporting waste materials is still underdeveloped.
- Policy Gaps – Incentives, subsidies, and infrastructure need faster implementation.

A Way Forward

Waste-to-biofuel technologies perfectly align with the goals of the Circular Economy and Green Chemistry. For chemical engineers, this field offers a unique intersection of reaction engineering, biotechnology, sustainability, and innovation.

As students and future professionals, we must explore research, pilot projects, and policy advocacy to promote these technologies. After all, what better way to power our future than with yesterday's waste?

Fun Fact

One tonne of food waste can produce enough biogas to run a small generator for 2–3 days. Imagine the energy hiding in your hostel mess leftovers!



Prit Modi

220101101036

B E- C.E, Sem-3rd

Chemical engineering



Technical Article

Computational Chemistry and Artificial Intelligence: Transforming the Future of Chemical Research

The 21st century is witnessing a powerful transformation in how scientific research is conducted. Traditionally, chemistry relied on hands-on experimentation, which was time-consuming and expensive. Today, with the advancement of computational power and machine learning algorithms, chemists are solving complex problems on a computer before even stepping into the lab. This field—called computational chemistry—becomes even more powerful when combined with artificial intelligence (AI).

Together, computational chemistry and AI are enabling chemists to model molecular behavior, predict chemical reactions, screen thousands of compounds virtually, and discover new materials and drugs with unprecedented speed and precision.

What is Computational Chemistry?

Computational chemistry is the use of computer simulations to model chemical systems. It applies quantum mechanics, classical mechanics, and statistical methods to predict the structure, properties, and reactivity of molecules.

Computational chemistry helps answer questions such as:

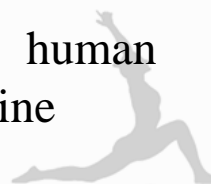
What is the most stable structure of a molecule?

How will a chemical reaction proceed?

What is the energy barrier of a transition state?

Artificial Intelligence in Chemistry

Artificial Intelligence (AI) refers to the simulation of human intelligence by computers. In chemistry, AI (especially Machine





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Learning or ML) is used to analyze large datasets to: Identify patterns, Predict molecular properties, classify compounds, Optimize reaction conditions. Unlike traditional models that rely solely on physical equations, ML learns from data—making it ideal for problems where we don't have an exact mathematical model.

Real-World Applications

1. Drug Discovery

Computational chemistry models how drug molecules bind to biological targets (proteins, enzymes), predicting binding energies and active conformations. Use of AI: Filters promising drug candidates from large libraries, Predicts drug-likeness, toxicity, solubility, Automates synthesis planning. Example: Pfizer used machine learning to identify COVID-19 antivirals faster than traditional methods.

2. Catalyst Design:

Catalysts speed up chemical reactions. Computational methods identify: Reaction pathways, Intermediate species, Activation energies. AI speeds up screening of metal-organic frameworks (MOFs) or transition-metal complexes to find the most efficient catalysts.

3. Designing Functional Materials:

Predicting electrical conductivity, band gap, or mechanical properties of polymers, ceramics, and nanomaterials. AI models trained on existing materials data can propose new compositions with desired properties. Example: Google's DeepMind used AI to predict crystal structures of new materials using their "Graph Networks" approach.





Technical Article

4. Environmental Chemistry:

Predicting water pollutant degradation pathways, Classifying hazardous chemicals, Modeling wastewater treatment efficiency. ML models can be trained on thousands of molecular descriptors to predict BOD, COD, or TDS levels in industrial effluents—helping industries improve wastewater treatment.

Popular Software & Tools in Computational Chemistry and AI

Software/Tool	Purpose
Gaussian	Performs quantum chemical calculations like DFT and Hartree-Fock methods for electronic structure analysis.
ORCA	Open-source tool for performing quantum chemistry calculations including DFT, semi-empirical, and ab initio methods.
Spartan	Provides 3D molecular modeling, conformational analysis, and spectra simulation for small and medium-sized molecules.
AutoDock	Used for molecular docking to predict the binding orientation and affinity of small molecules to proteins.
Schrödinger Suite	An integrated platform for drug discovery, materials science, and computational chemistry. Offers modules like Maestro for visualization, Glide for docking, Jaguar for quantum calculations, and Desmond for molecular dynamics simulations. It is widely used in the pharmaceutical and material science industries.
RDKit	A Python-based chemoinformatics toolkit used for molecular fingerprinting, descriptor calculation, and integration with machine learning workflows.
TensorFlow, PyTorch	Open-source AI frameworks used for building deep learning models to predict molecular properties, reaction outcomes, or classify chemical datasets.

Technical Article

Future Trends

- **AI-designed molecules** that never existed before (inverse design).
- **Autonomous laboratories** that run experiments based on AI predictions.
- **Quantum computing** may solve chemical problems beyond classical computing limits.

The **next generation of chemists** will likely work alongside AI tools, not as a replacement, but as powerful collaborators. The fusion of **computational chemistry** and **artificial intelligence** is more than a trend—it's a revolution. These tools allow chemists to shift from *trial-and-error* to *prediction and precision*. Whether it's discovering drugs, designing catalysts, or solving environmental problems, this integrated approach represents the future of chemical research.



Dr. Siddharth Patel

Assistant Professor

SRICT-ISR

Literary Section

Power of Positive Thinking: The Story of George Dantzig



On 8th November 1914, George Dantzig was born in Portland, Oregon, USA. George Dantzig's parents were Tobias Dantzig and Anja Ourisson. Dantzig attended Powell Junior High School and Central High School. He was fascinated by geometry, and this interest was further nurtured by his father. In the early 1940s, George Dantzig was a graduate student in mathematics at the University of California, Berkeley.

One day, he arrived late to a statistics class taught by the renowned professor Jerzy Neyman. On the blackboard, there were two mathematical problems written. As he arrived late for class, Dantzig assumed the mathematical problems written on the blackboard were to be a delayed homework assignment. After copying them down, he worked on them throughout the course of the following few days.

Literary Section

The mathematical problems were more difficult for him than normal, but he eventually solved them and submitted them to his professor.

Six weeks later, an enthusiastic Neyman came to George's door. It turned out that the "homework problems" were two famous unsolved problems in statistics. Dantzig had solved them by mistake, assuming they were just ordinary homework assignments.

The story of **George Dantzig**, an American mathematical scientist, is often cited as a powerful example of how **a positive mindset and lack of limiting beliefs** can lead to remarkable achievements.



Dr. Prakash Majee
Assistant Professor
SRICT-ISR




Literary Section

Sustainable Living and Practices


A Path to a Greener Future

Sustainable living refers to the practice of reducing our impact on the environment by adopting eco-friendly habits and minimizing waste. As the world grapples with climate change, pollution, and resource depletion, sustainable living has become an essential aspect of modern life.

Benefits of Sustainable Living

1.  Reduces carbon footprint: By reducing energy consumption, using public transport, or driving electric vehicles, we can significantly lower greenhouse gas emissions.
2. Conserves natural resources: Sustainable practices like reducing water waste, using renewable energy sources, and recycling help preserve natural resources for future generations.
3. Improves health and well-being: Sustainable living promotes healthy eating, reduces exposure to pollutants, and enhances overall well-being.

Sustainable Practices

1. Reduce, Reuse, Recycle: Minimize single-use plastics, reuse items when possible, and recycle materials to reduce waste.
2. Use eco-friendly products: Choose products with minimal packaging, made from sustainable materials, and designed for recyclability.
3.  Conserve energy and water: Use energy-efficient appliances, turn off lights and taps when not in use, and harvest rainwater.



Literary Section

4. Eat sustainably: opt for locally sourced, organic, and seasonal produce to reduce carbon footprint and support sustainable agriculture.
5. Use public transport or walk/bike: Reduce reliance on fossil fuels by using public transport, walking, or biking for shorter trips.

Implementing Sustainable Living

1. Start small: Begin with simple changes like reducing plastic use or using public transport.
2. Educate yourself: Learn about sustainable practices, climate change, and environmental issues.
3. Involve your community: Share knowledge, participate in local initiatives, and encourage others to adopt sustainable practices.
4. Make it a habit: Incorporate sustainable practices into your daily routine, making them a part of your lifestyle.

Conclusion

Sustainable living is a collective responsibility that requires individual and community efforts. By adopting eco-friendly habits, reducing waste, and conserving natural resources, we can create a greener, healthier future for ourselves and future generations.



Kishan Kumar

Enrollment No. : 240102102001

Chemical Technology

Literary Section

Social Media

Social media has become an important part of our daily lives. Platforms like Facebook, Instagram, Twitter and WhatsApp help people connect with friends and family, Share their thoughts, and stay updated. with the latest news. Social media is very useful for students and professionals as it helps in learning, sharing ideas, and networking with people world. across the However, Social media also has some negative Effects.

Many people, especially teenagers, spend too much time on social-media, which affects their Studies and health. Excessive use can Lead to addiction, anxiety, and poor Sleep. Fake news and Cyberbullying are other serious problems connected with social media. Despite these drawbacks, social media has many benefits if used wisely. It helps people express themselves, promotes Small businesses, spreads awareness. issues, and connects about important people in emergencies.

To use Social media in a positive way, people should limit their screen time, think before Sharing any information, and avoid online arguments. Parents Should guide their children about the Safe use of social media. In Conclusion, social media is a powerful tool that can bring people together and spread Know Knowledge. It is our responsibility to use it properly and avoid its harmful Effects.



Pandey Kartik

Enrollment No. : 240102102003

Chemical Technology

Literary Section

Short Poetry

सब कुछ अपनाना सीख लो ।
जो पाना हैं उसे छोड़ना सीख लो ।
जो मिले उसे खुशी के साथ रख लो ।
जो होना था वो हो गया बस,
अब उससे एक नया सवेरा बनाना सीख लो ।।।।

जिंदगी तू कायम रहे,
यूं कुछ न कुछ सिखाती रहे।।
कभी जीत कर भी हराती रहे,
तो कभी हार के भी जीता तो रहे,
जिंदगी तू यूहीं कायम रहे।।।



Vasava Payal

Enrolment no. 230202117038

Branch/Department: Microbiology

Literary Section

"Love story of success and failure"

Falling deep in sea,
Thought that was love
but that was cheap .
Closed my eyes and
saw that dreamy cries,
But that was a dream
and the alarm rings.
Hope that was true
but everything was blue,
As I was sinking deep
the hands I was seeking for,
Never came finding me.
But the hands that came
for me and hugged me
Whisper in my ears that,
Now you are mine
and You will be fine !!



Surabhi M. Rawat

Enrollment No. : 230202117035

Microbiology

Sports Gallery

UPL University successfully organized a 10-Day (23rd June – 4th July 2025) Summer Sports Camp which focused on skill development in Basketball and Volleyball, along with sessions on fitness and discipline. The camp aimed to build physical strength, teamwork, and awareness of sports rules and techniques among students.

Daily sessions included warm-ups, structured drills, theoretical learning, and friendly matches. Students were trained in basketball skills such as dribbling, passing, shooting, and defense, and volleyball techniques including serving, smashing, and blocking. Special sessions on rules, sportsmanship, and meditation helped in the overall development of participants.

First-year B.Sc. Chemistry students actively participated and showed great enthusiasm. The program concluded on a high note, promoting the spirit of sports and healthy living among students.

“With passion, practice, and purpose — our Summer Camp ends, but the spirit lives on!”



NCC/NSS Gallery

Students from the NSS Unit actively participated in a Tree Plantation Program organized by the Government of Gujarat on 17th July 2025 at Dehli Village, near Valia. The program was held in the esteemed presence of the Honorable Forest Minister. NSS volunteers represented the institute and enthusiastically took part in the plantation of saplings as part of a state-level initiative to promote environmental sustainability and afforestation. The event aimed to spread awareness among youth on the importance Of green cover and ecological responsibility, Students had the opportunity to witness large-scale plantation efforts, interact with government officials, and contribute to a meaningful cause.

Such initiatives not only provide practical exposure but also instill a deep sense of environmental commitment among students. "Serving nature through action is the true spirit of - NSS unit.



Students' Corner

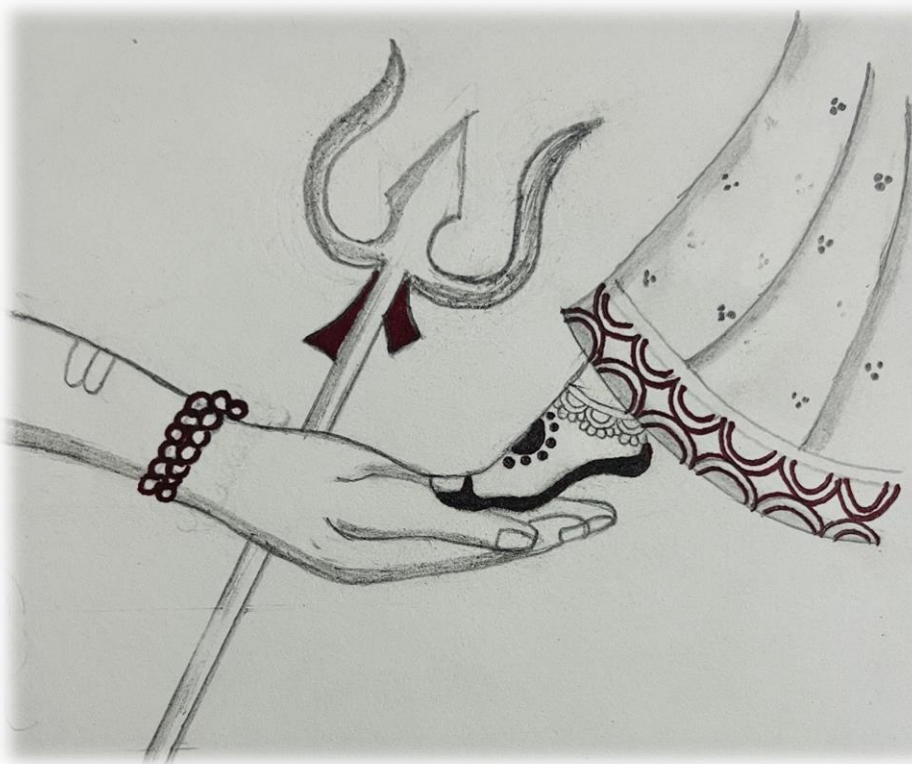


Art by: Yug Rathod
Enrollment No. : 240102106006
Program/sem : BE/3
Branch/Department : ME

Students' Corner



Art by: NIRMAL MANDAL
Enrollment No. : 240202107029
Program/sem : B.Sc/3
Branch/Department : Chemistry



Art by: Kashish Gohil
Enrollment No. : 230102103007
Program/sem : BE/5
Branch/Department : Computer

Students' Corner



Art by: Nikita Pandey
Enrollment No.: 230101103031
Program/sem : DE/5
Branch/Department : Computer



Art by: Prit Modi
Enrollment No.: 220101101036
Program/sem : BE/3
Branch/Department : Chemical

Students' Corner

Photography



Pooja Roy

Enrolment no. 240102303007

Program/sem: BE/5

Branch/Department: Computer engineering

Vidhi Patel

Enrolment no. 240202117033

Program/sem: B.Sc./3

Branch/Department: Microbiology



Students' Corner

Photography

Priyank Avichal

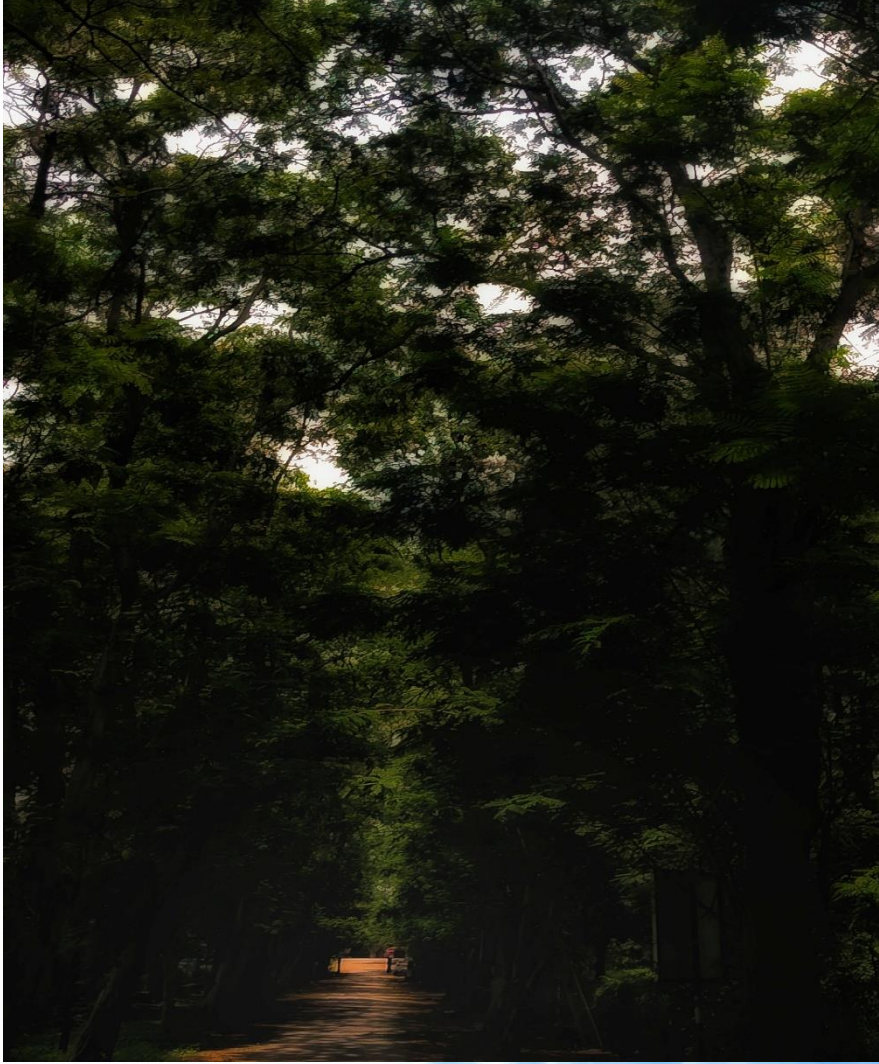
Program/sem: BE/I

Branch/Department: Mechanical engineering



Students' Corner

Photography



Janshi Tailor
Enrolment no. 2402021170497
Program/sem: B.Sc/3
Branch/Department: Microbiology



Gayatri Patil
Program/sem: DE
Branch/Department: Computer



UPL UNIVERSITY

OF
SUSTAINABLE TECHNOLOGY

**Block No.402, Ankleshwar-Valia Road,
Taluka: Valia, District: Bharuch-393135
TEL: +91-9712177799
MOBILE: 9727745875/76**



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