

# KATHAN

E-Magazine For UPL university of sustainable technology

*Kathan*  
ज्ञानम यजामहे।

## ॥ अभ्युत्थान ॥

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# #Student Editors



**SAURABH SINGH**  
Computer Engi.  
2nd sem

**DARSHAN PRAJAPATI**  
Computer Engi.  
2nd sem



**ANJALI YADAV**  
MSc  
2nd sem

**PRITI PAL**  
EST.  
4th sem



**AKSHAY GUPTA**  
CE  
2nd sem

**DIPALI PATEL**  
CE  
2nd sem



**DEV JOSHI**  
EE  
2nd sem

**JANE ANTHONY**  
CT  
6th sem



**DEV JOSHI**  
ME  
4th sem

**HIMANSHU DUBEY**  
ME  
4th sem



**MAHESH VARADKAR**  
CT  
6th sem

**NISHA PANDEY**  
BSc  
2nd sem



# Student Felicitation Programs.

## ॥ अभ्युत्थान ॥

A felicitation program, ABHYUTTHAN, was organized to felicitate 2021 batch (1st semester) students of UPL University for their results of Winter-2021 on 9th June, 2022. A program was organized by Mechanical Engineering Department, SRICT. In his welcome speech, Dr. Shrikant J. Wagh (PROVOST, UPL University), motivated and appreciated students for getting very good results. Dr. Dhiren Patel (Director VJTI, Mumbai) and Mr. Kishore Surti (Treasurer, ARES) graced the occasion with their presence in the event. President of UPL University, Mr. Ashok Panjwani, applauded the students for their efforts and also shared unique details of the results of Winter-2021 examinations. Some meritorious students shared feedback for their success and support provided by the University to get such wonderful results.

Chief guest of the program, Mr. B. J. Prajapati, Associate Vice President, Godrej Industries Ltd., congratulated Gold medallists and recipients of the excellence award and motivated students by sharing live examples of his success story.

Chancellor of UPL University, Mrs. Sandra R. Shroff appreciated the students and faculty members for their whole-hearted efforts. Certificate of appreciation and cash prizes worth Rs. 141000 were bestowed upon the meritorious students. Dr. Hemant Gupta (Professor, HOD, MED) concluded the felicitation program with gratitude to all.



A felicitation program, ABHYUTTHAN, was organized to felicitate B.E. 2020 batch (3rd semester) students for their results of GTU Winter-2021 on 9th June, 2022. Program was coordinated by Mechanical Engineering department, SRICT. In his welcome speech, Dr. Shrikant J. Wagh (PROVOST, UPL University), introduced Chief guest of the program, Mr. Saket Guha, Unit Head, Convergence Chemicals Pvt. Ltd. and appreciated students for getting very good results. President of UPL University, Mr. Ashok Panjwani, appreciated the students for their efforts and also shared unique details of the results of GTU Winter-2021 examinations. Some meritorious students shared feedback for their success and support provided by the University to get such wonderful results.

Chief guest of the program, Mr. Saket Guha congratulated recipients of the excellence award and motivated students by sharing live examples of his success story.

Chancellor of UPL University, Mrs. Sandra R. Shroff appreciated the students and faculty members for their whole-hearted efforts. Total 20 students of 3rd sem got felicitated in the program. Dr. Hemant Gupta (Professor, HOD, MED) thanked the management for granting cash prizes worth 36000₹ to the students, and all other helping hands for organizing such wonderful events.



*Congratulations*



# Technical Articles

- **What's causing fire in electric vehicles?**

With many recent incidents of electric vehicles (EV) catching fire, particularly two-wheelers, many of us are wondering what is the root cause of such incidents?



We can easily blame the poor cell quality, cell chemistry, hot climate and the poor quality of battery management systems. Here, I doubt. Then why did Tesla or other reputed company's cars catch fire? They have the best quality EV system, battery cells, and complete control of battery operation. Therefore, we need more understanding of battery cells and their behaviour, arrangements, and controls in all types of EVs. There could be many points of failure that need more thorough investigations.

In the present EV system, battery management systems (BMS) are regarded as critical battery protection systems for safety accidents: known as thermal runaway.

The BMS, today, can detect the external surface temperature, voltage, and state of charge (SOC) of a battery cell, and protect the cell/battery pack from overcharge by sending an alarm signal if the battery's external temperature exceeds the normal range. We need to understand that there is a large difference between the battery's internal and external temperature due to the poor thermal conduction in a tropical country like us.

In today's BMS system, safety mainly relies on a specific gas or smoke detection system and focuses on BMS protection. Specific gases like carbon monoxide (CO) and different hydrocarbons that are consequences of overcharging or overheating are believed to give an effective indicator for safety warning to the battery system.

In technical terms, the above gases arise from the reduction and oxidation of the electrolyte and the degradation of the protective surface film (SEI) at nearly 90 degree Celsius, when the fire has already occurred and the smoke detector gives rise to an alarm signal to the system. Here, the present detection system may not be the best indicator of micro lithium dendrite growth (which is common in graphitic anode cells) until a battery's internal temperature exceeds 50 degree Celsius, and until that point, the actual thermal runaway (fire or smoke) may not even have started. In many incidences that have been reported worldwide, the detectors were unable to detect the lithium dendrite growth and prevent battery safety failure, causing recent catastrophic events in many countries.

The important question is what will be the strategy to prevent or understand such events and what could be the early control measures. Many reports suggest that hydrogen gas (H<sub>2</sub>) was found to be the most sensitive gas and can be detected much earlier than the other gases. Thus, the lithium dendrite growth and thermal accumulation processes inside the battery can be prevented by cutting off the charger at the time when a trace amount of hydrogen gas is detected.

In modern EVs, developing an effective detection method of micron-scale lithium dendrite formation for early safety warning can improve the safety level of lithium-ion battery systems. Unfortunately, in two-wheelers or three-wheelers, this type of detection or BMS will not be a cost-effective solution and we need more unique thinking to prevent such fires here.

The government, along with effective research and development, should give more awareness to the customers, and common people, to increase their confidence level. The EV system is new in our society and needs more knowledge creation, dissemination, and training on how to use it safely.

**Reference:- Department of Energy Science and Engineering, IIT Bombay.**

**From :- Electrical Engineering Department**

# SUPER CAPACITORS: THE FUTURE OF ENERGY STORAGE

Super capacitors have been around since 1966 but were never considered as a serious alternative for batteries. Ironically, we could have said the same for AM radio before Armstrong developed the super heterodyne receiver. It may not be long before a major discovery will change the fate of super capacitors forever.

Super capacitors have a lot of promise in them. But what exactly are the reasons why alternative energy industries are not so fond of this device (yet)?

Let us take a closer look at Super capacitors, its inherent advantages, its glaring weaknesses and the current studies in improving it.



## Super capacitor defined

A super capacitor or ultra capacitor is essentially similar to the basic capacitor in the sense that it stores energy in an electric field. As such, it can quickly deliver and store energy because there is no chemical reaction involved. It can also survive thousands of charge and discharge cycles – obviously more than a battery can.

Like the basic capacitor, a “super” also contains two conducting plates. But these are “virtual plates” and are actually substrates of the same material. The substrate is a sponge-

like, porous material made from activated carbon. They are immersed in an electrolyte consisting of positive and negative ions dissolved in a solvent. Just like an ordinary capacitor, the substrates are separated by a dielectric separator.

Energy is stored in the electric field created by the two oppositely charged substrates or electrodes. When voltage is applied across the two electrodes, a charge builds on them—one positive, one negative. This makes the ions from the electrolyte go to the electrode with a charge opposite with them. As a result, the electrodes of a super capacitor end up having two layers due to the addition of the ions. The super capacitor is essentially two capacitors in series.

During discharging, the charge on the plates decreases as electrons flow through a circuit. This decrease in charge results in ions releasing their hold on the plates and returns to the electrolyte.

## Advantages

We can recall that a battery stores energy in a chemical reaction. That is, ions are actually introduced inside the electrode's atomic structure. Because ions in super capacitors only "cling" on the plates, this results in much faster charge and discharge cycles. Also, capacitors can last much longer than batteries because they do not suffer the wear and tear caused by chemical reactions.

Both capacitors and super capacitors store energy through the separation of charges. There is a difference however in the measurement of this separation. In a common capacitor, the plates are usually in the order of tens of microns. Recall that capacitance depends on how small the distance is between the plates. An ordinary capacitor cannot have larger capacitance because they are limited by the thickness of the dielectric. In super capacitors, the distance is not between the plates but between the ions and the electrode. This distance is so tiny that is only measured in nanometres! Consequently the super capacitor contains capacitance in the order of thousands of farads.

This is only one reason though, as the activated carbon in the substrate also has something to do why super capacitors can have large capacitances. Recall again that aside from plated distance, capacitance is directly proportional to the surface area of the plates. The truth is it's not how large the area of the plates is but how many electrons can cling on the plate. Since the plate of a super capacitor is made from activated carbon, electrons have more space to cling on than with an ordinary metal plate.



# Why not super capacitors?

A super capacitor might be a huge leap over a common capacitor but when it comes to energy storage and price, it still way behind batteries. Although the price of super capacitors have gone way down since 2001(\$5000 to \$50), it is still more expensive than a lithium-ion battery. Also, it can store only about five percent of the energy that a lithium-ion can.

It would be possible that super caps will replace lithium-ion batteries in cell phones. Since it can last for 10-15 years, you will not need to change a super cap. The cell phone may go down but the battery would still be in top shape. Environmentalists would be happy with super capacitors as their long life means less waste disposal. A flaw however is that the phone wouldn't stay charged for long using, at least, today's super capacitors.

The greatest challenge with super capacitors could be its ability to handle voltage. A 20 uF capacitor could handle as much as 300 volts, while a super cap would handle only 2.7 volts. The electrolyte inside the super cap would break down at a higher voltage.

## Application

A number of electric vehicle manufacturing companies are now using super capacitors for acceleration.

Aside from this, the devices can also be found in cell phone base stations, backup power systems and audio systems.

Super capacitors have a future on the electric grid. To leave a buffer for power surges, most transmission lines today operate around 90% of their capacity. With the help of super capacitors to absorb power surges, these transmission lines could run closer to its full capacity.

Super capacitors could also become an important piece for the growing market of micro hybrid cars. In this, a super capacitor could provide the power during the stop and also provide power for the restart. The supercap will then be recharged while the car is traveling.

**DHRUVIL BABUBHAI PATEL**  
(EE : 6th semester)



# Art and Drawings

## 1. Drawing:-



**Anand Vasantbhai Patel**  
(EE : 2nd semester)



## 2. Rangoli:-



**Krutika Patel**  
(EE : 2nd semester)



### 3. Mehndi:-



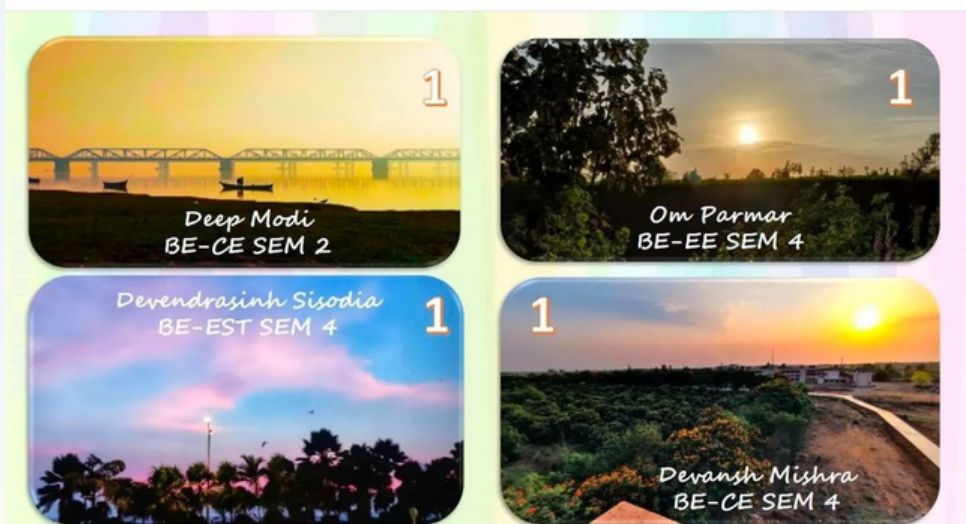
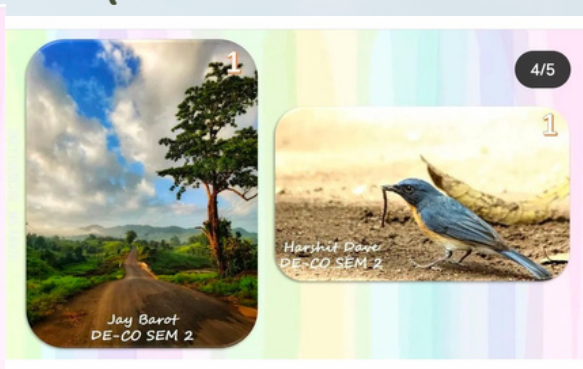
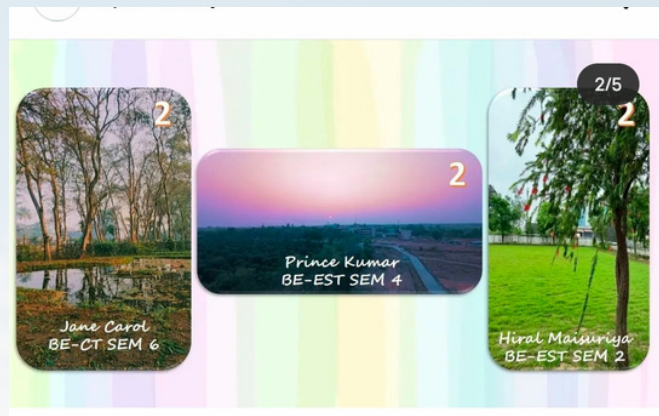
**Prachi Patel**  
(EST : 6th semester)



# Winners of Photography Competition

Organized by E.S.T Department

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## 1. Poem :-

Aur mera mehboob fir se bharat maa ki seva m Jud gaya..  
Fir aaya ek waqt manhus sa.. lag gayi jb humare desh ko dushmano ki najar..  
Kyuki Ghop diya padosiyon n Bharat maa ki pith mein khanjar..  
Kesi raat kesa din.. ab to puri aasman hi kali thi.. mitti k laal hone ki jo rach di gayi  
bhavishyavani thi..

Thi Bharat maa ko ab unke putro ki jarurat..  
Mar mitne k liye taiyar the unke putra karne apni maa ki hifajat..  
Garaj uthe jb Bharat k Sher ranbhumi k uss kshetra m.. khisak gaye dusmano k paon  
garaj k uss kampan se..

Natmastak ho gaya duniya ka har ek desh Bharat maa k santano ki veerta se.. jit liya  
Bharat n wo yudh maa durga k ashirvaad se..  
Rakh k Bharat maa ki laaj..garv se pehna humne jit ka taaj..  
Chha gayi khushiyon ki leher humare desh ki sarjami p..lehra raha tha tiranga shaan  
se humare sarhad ki jami pe..

Ashaanti se bhare iss man ko bhala bss itne se hi shaanti kese milti.. thame hue iss  
dil ko bhala uski awaj suna bina dhadkan kese milti..  
Inhi dil aur dimag ki asaantiyon k bich.. ek call aaya..

Khushi se ucchli main.. aur panch second k andar call uthaya..

Ek anjaan si awaj aayi.. pucha aap major Aman rathod ki patni bol rahi hain..  
Mene kaha haan jise chattane bhi na rok sake uss major Aman rathod ki patni bol  
rahi hu..

Ek sannata sa chha gaya.. jo meri dhadkane badha gaya..  
Par sayad sannata hi sb kuch keh gaya.. shabd to bss ab ek aupcharikta the.. jo  
phone karne wale ko pure karne ke mile aadesh the..



Dhimi par garv se bhari awaj me.. mere pati k amar hone ki kahani wo suna gaya.. par sayad mere kano m itni himmat na thi.. mera phone haath se chhut gaya.. Pure vishwa k Pani ko apni aankhon m sameti mai.. usse bahaye ja rahi thi.. mera man to garv se bhara tha.. par dil ko uski germaujudgi khaye ha rahi thi..

Tirange m lipti uski laash.. chikh chikh kar uski virta k praman de rahi thi.. aur uske picche chal rahi wo mehfil uski iss virta p natmastak hue ja rahi thi.. Shahid ka thappa lag gaya tha uske naam k aage.. sayad ek deshbhakt k liye yahi sabse badi uplabhdhi thi..

Kher uski sahadat ki khabar hi mujhe khokhli kar chuki thi.. jane meri aatma ko mere sarir se alag kar chuki thi..

Nishabd ho chuki thi m.. sann ho chuki thi mai.. ashuwon ki behti dhaara se bheeg chuki thi mai.. tut chuki thi mai.. ujad chuki thi mai.. jine ki iksha bhi chhod chuki thi mai..

kaan the.. par behri ho chuki thi.. aankh the.. par andhi ho chuki thi.. jaban thi par gungi ho chuki thi.. dil tha.. par dhadkane band ho chuki thi.. bhaav the.. par bhavnaye khatam ho chuki thi.. puri duniya saath thi fir bhi akeli ho chuki thi..

Fir bhi Dukh k iss samandar k bich garv ki ek naav ter rahi thi.. jo mujhe bhaavnao k bhavsagar m dubne se rok rahi thi..

Uski kurbaani p hamesha fakra rahega mujhe.. uski bahaduri p humesha garv rahega mujhe.. jindgi m chahe koi bhi aa jaye.. par uske jesa koi samjhega na mujhe.. Ek adhuri si baat thi jo bata n paayi usse..

Afsos rahega mujhe.. jo keh n payi usse.. kaash wo ye jaan pata.. K chhod gaya h wo apne vasiyat ki raksha karne wala..



**Ankit Kumar**  
(EST: 2nd semester)



Suna pada hai raasta  
Ab koi kahi dikhta nahi  
Qaid darwaazo k piche  
Se hi cheekhe aarahi



Koi darinda harqato se  
Apni baaz aaya nahi  
Madad ko pukaarte par  
Koi waha jata nahi

Kali andheri raat mein  
Yeh kesa hahakaar hua  
Ek janaza aur utha  
Ek balatkar aur hua...

Haatho mein baandhe hathkadi  
Par fir bhi woh azaad hai  
Siyasti yeh khel  
Uske sar pe jiska haath hai

Thodi sharam gar hai bachi,  
Toh yeh dikhawa chodh do  
Insaaniyat k naam pe  
Kaalikhe muh par pout lo

Chodh do tum yeh muqadmein  
Sch se hum vaaqif sabhi  
Kala poshaaak pehne kar  
Qartab dikhate tum sabhi



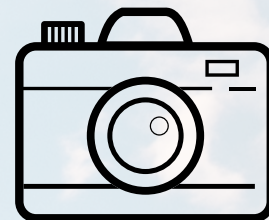
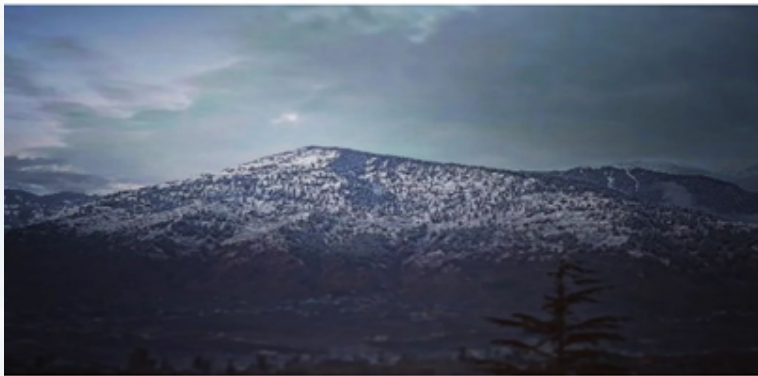
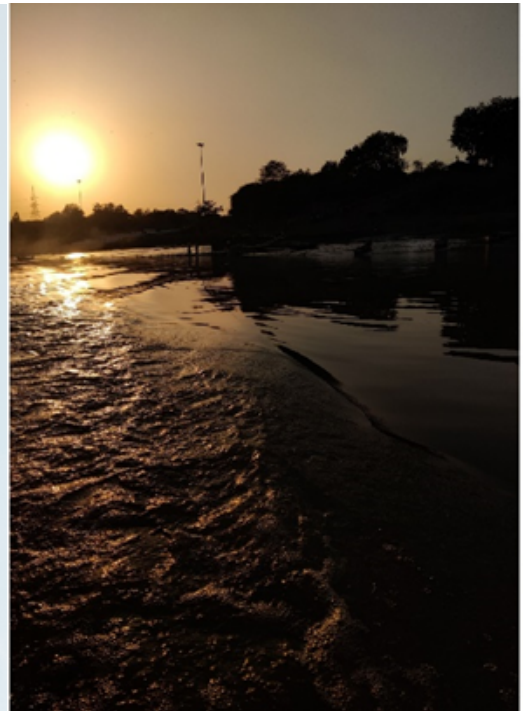
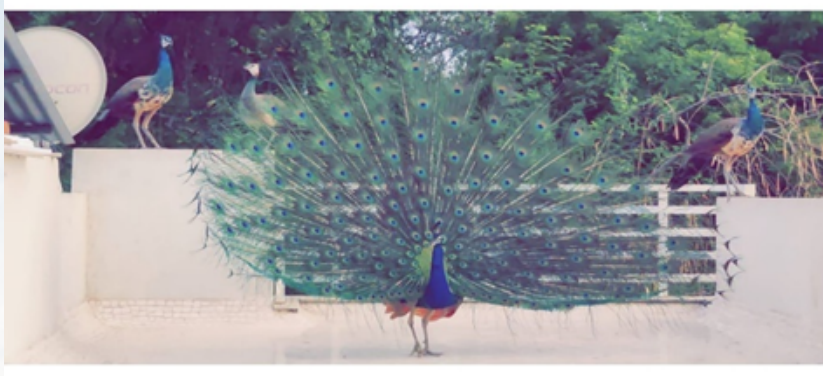
Un darindo k liye  
Yeh kaam toh aasan hai  
Par un gharon ka kya ?  
Jinka bik gaya samman hai..

**Abhishek Saha**  
(EST: 4th semester)





## 2. Photography:-



**Jayraj Makwana**  
**(EST : 4th semester)**



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