Report

on

TWO WEEK STUDENT WORKSHOP ON ELECTRIC VEHICLES

23rd March – 06th April, 2023

Department of Mechanical Engineering
&
Incubation Cell
Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur

CONVENOR

Prof. Dheeraj Joshi, HOD, ME
Mr. Ajay Dhanopia, Incubation Cell

COORDINATOR

Dr. Chandan Kumar, Associate Professor (ME)

STUDENT COORDINATOR

Mr. Jitendra Kumar Meena (VI Sem.-ME)

MENTOR

Shree Kartik Muhal, UVIK Automobiles, Jaipur

Workshop Approval Notice

Request Note

To,
The Director (Academics),
SKIT, Jaipur

24/02/2023

Subject: Financial support for Incubation Cell Project "Design & Development of Conversion of Petrol Car to Electric Car"

Respected sir,

SKIT Incubation Cell has scheduled a **10 days (40 hours)** workshop on **"Design & Development of Conversion of Petrol Car to Electric Car"** for the students of the **Mechanical & Electrical Engineering Department** in association with **M/s Uvik Automobiles Pvt. Ltd. Jaipur.**

UVIK Automobile is a skill development and engineering solutions organization in pursuit of enabling technology to reprograms It provides various learning programs and hands-on-workshops in Automotive, Computer Aided Designing and E-Vehicle technologies. It trains the learning aspirants in a simple, structured, and hands on experience in our state-of-the-art facility to empower, and enable them to realize their dreams and power their passion for technology.

This workshop is fundamental to the job assistance program, it will cover electric vehicle technologies and the conversion of a petrol car to an electric car. The workshop will include the development of electric vehicles, electric power trains, power inverter systems, system controllers, battery management systems, motor calculations, lithium ion batteries etc. The timings of workshop will be just **after college hours.**

We need the financial support of **Rs. 98153 /-** for purchasing the components in order to execute the project.

The workshop details and the bill of material are attached along with the application for your reference.

Kindly grant us permission for organizing this workshop successfully.

Mr. Ajay Kumar Dhanopia
Coordinator-Incubation Cell

Mr. Kartik Muhal
Founder & CEO
Uvik Automobiles Pvt. Ltd.

24/02/2023

Dr.Dheeraj Joshi
Head-ME Deptt.

Dr. Sarfaraj Nawaz
Head-EE Deptt.

Recommended
25/2/23

List of Components

S.No.	Name of Component	Technical Specifications	Quantity	Cost (Rs.)
1	Used Car Maruti (800)	ARAI Mileage16.1 kmpl City Mileage13.1 kmpl Fuel Type Petrol Engine Displacement (cc)796 No. of cylinder 3 Max Power (bhp@rpm)37bhp@5000rpm Max Torque (nm@rpm)59Nm@2500rpm Seating Capacity4 Transmission Type Manual Fuel Tank Capacity 28 ltr Body Type Hatchback Ground Clearance Unladen170mm	1	25000
2	BLDC Motor	3 KW 60V	1	26029
3	BLDC Controller	3KW 60V	1	12719
4	DC-DC Converter	60V-30 amp	1	915
5	Wiring Harness	Heavy Duty Relay Wiring Kit for High Power (3KW/60V/30 AMP)	1 set	1950
6	Digital Console	60V-30 AMP	1	2590
7	Throttle		1 set	950
8	Charger	60V,30 amp	1	3000
9	Aesthetics	Fiber Sheet/ Metal Sheet 22 Gauge	As per weight	10000
10	Training Cost	Expert remuneration, conveyance, study material, certification, tools & equipment etc.		15000
		Total Cost		Rs.98153/-

Approved
15/3/2023

Workshop Summary

The Electric Vehicles Workshop began on 23rd March, 2023 with an inaugural function graced by Prof. Dheeraj Joshi, Head of Department, Mechanical Engg, SKIT Jaipur, Mr. Ajay Dhanopia. The inaugural ceremony of the student Workshop was organized under the guidance of Prof. Dheeraj Joshi, Head of Department, Mechanical Engg, SKIT Jaipur. The other dignitaries were present in Inaugural ceremony were Prof. Ashish Nayyar, Dy. HOD Dr. Vikash Gautam, faculty members and students.

There are 33 students from the Mechanical Engineering and Electrical Engineering department have participated in workshop. The objective of the workshop is to introduce the concept and techniques of conversion of conventional vehicles to E- vehicles.

Day 1:

Workshop start with objectives. In day-1 an Introduction session have been taken by UVIK Automobile experts. They introduced the curriculum for the workshop and took sessions about the concepts required for electrical vehicle conversion.

They also taken a hands on session on the car components and discussed the different parts of the vehicle and their functions, mechanisms.

Day 2:

In day-2, session based on the motors and different electrical components required for electrical vehicles and then seen the different components of vehicles in the lab that will use in the conversion of vehicles. Students learnt the function of each and every component related to e-vehicles. Students also had a hands-on session on the electrical components and their elements.

The electrical components used in the conversion processes are:

1. **Traction battery pack**

Traction battery pack is also known as Electric vehicle battery (EVB). It powers the electric motors of an electric vehicle. The battery acts as an electrical storage system. It stores energy in the form DC current. The range will be higher with increasing kW of the battery. The life and operation of the battery depends on its design. The lifetime of a traction battery pack is estimated to be 200,000 miles.

2. **DC-DC Converter**

The traction battery pack delivers a constant voltage. But different components of the vehicle have different requirements. The DC-DC convertor distributes the output power that is coming from the battery to a required level. It also provides the voltage required to charge the auxiliary battery.

3. **Electric motor**

Electric traction motor is the main components of electric vehicle. The motor converts the electrical energy into kinetic energy. This energy rotates the wheels. Electric motor is the main component that differentiates an electric car from conventional cars. An important feature of an electric motor is the regenerative braking mechanism. This mechanism slows down the vehicle by converting its kinetic energy into another form, and storing it for future use. There are basically two types of motors DC and AC motors.

4. **Power Inverter**

It coverts DC power from the batteries to AC power. It also converts the AC current generated during regenerative braking into DC current. This is further used to recharge the batteries. The inverter can change the speed of the

5. **Charge Port**

The charge port connects the electric vehicle to an external supply. It charges the battery pack. The charge port is sometimes located in the front or rear part of the vehicle

6. **Onboard charger**

Onboard charger is used to convert the AC supply received from the charge port to DC supply. The on board charger is located and installed inside the car. It monitors various battery characteristics and controls the current flowing inside the battery pack.

7. Controller

Power electronics controller determines the working of an electric car. It performs the regulation of electrical energy from the batteries to the electric motors. The pedal set by the driver determines the speed of the car and frequency of variation of voltage that is input to the motor. It also controls the torque produced.

8. Auxiliary batteries

Auxiliary batteries are the source of electrical energy for the accessories in electric vehicles. In the absence of the main battery, the auxiliary batteries will continue to charge the car. It prevents the voltage drop, produced during engine start from affecting the electrical system.

9. Thermal system (Cooling)

The thermal management system is responsible for maintaining an operating temperature for the main components of an electric vehicle such as, electric motor, controller etc. It functions during charging as well to obtain maximum performance. It uses a combination of thermoelectric cooling, forced air cooling, and liquid cooling.

10. Transmission

It is used to transfer the mechanical power from the electric motor to the wheels, through a gearbox. The advantage of electric cars is that they do not require multi-speed transmissions. The transmission efficiency should be high to avoid power loss.

Day 3:

Students learnt about the basic concept of drafting in AutoCAD software. They also drafted an electrical motor and Kaplan turbine on the same. They learnt different commands used in AutoCad.

Day 4:

In day-4 students took learning to another level and drafted some more complex parts. Students also learnt about new commands such as linear and polar array, offset etc. An assignment based on the design of e-vehicle also completed by the students.

Day 5:

Students learnt about the various calculation aspects that are considered while concerting of a e-vehicle. Also they disassembled the engine of the car.

Day 6:

In day-6 students got a chance to portray team work skills. Students were divided into teams as per the requirement. One team was assigned a task of designing the car's face lift, one was making calculations of the components efficiency while other teams were engaged in disassembling different parts of the car.

Day 7:

In day-7 students had a practice and revision session of what they learnt so far. Students also did the designing and fixture of the electric motor and the gear box in the car.

Day 8:

In day-8 student took dimensions of bonnet on the metal sheet, and designed the shaft of motor with turning on lathe, also they drill the mounting of motor, and gave a surface finish with grinding, joint the clutch pedal, they have welded the controller on angles.

Day 9:

In day-9 students have connected motor mounting and all electronic components with motor like controller, DC to DC Converter, and made the side design of bonnet, cut the metal sheet into that design of car.

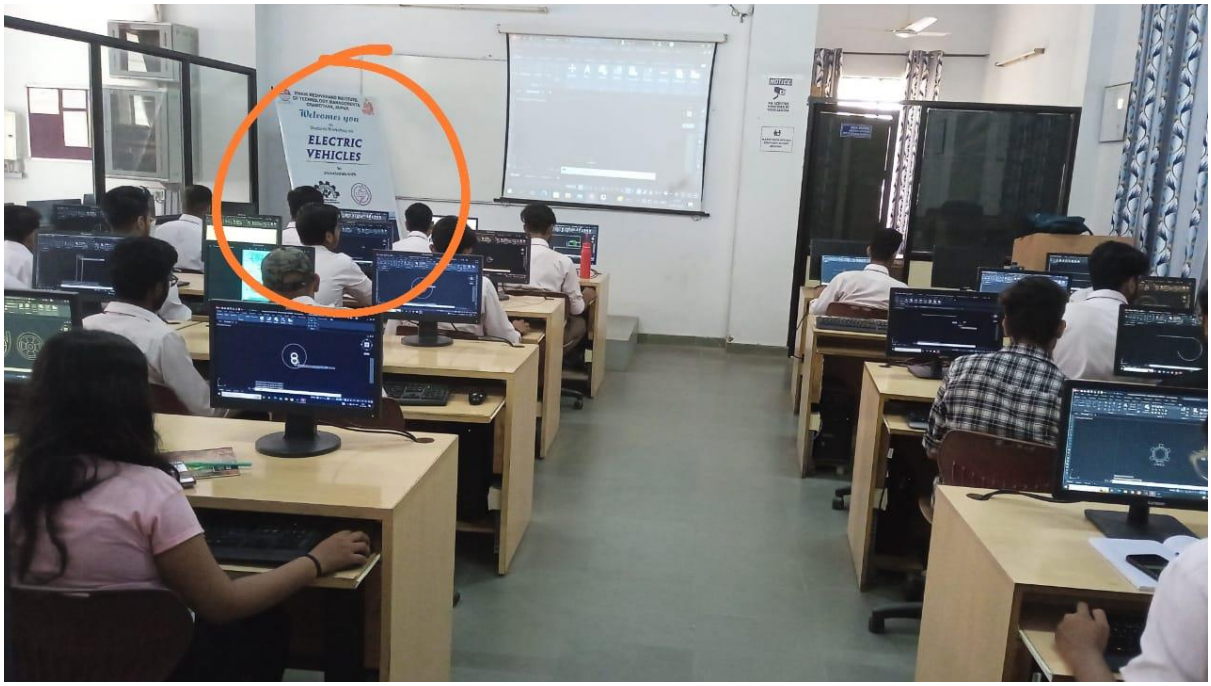
Day 10:

In day-10 students have design and fitted the bonnet, connection of motor, controllers have been done and also bumper and headlight housing in car.

Day 11:

In day-11 students completed the electric connections and finally connected the batteries with the car and took first test drive. They also did the face lift job with metal sheets. Just some final touch up for aesthetics and the car would be ready for demonstration.

Workshop Photographs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VEHICLES


EMERGENCY EXIT
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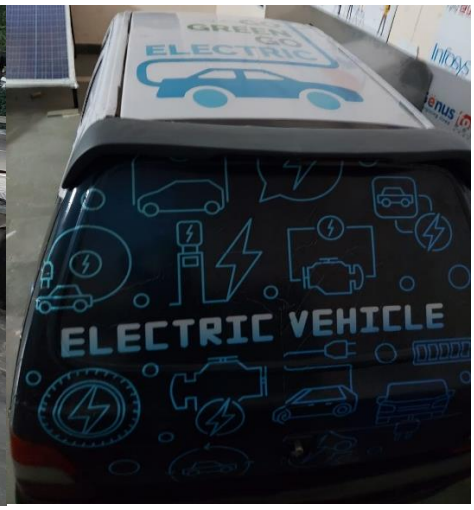
ELECTRIC VEHICLE


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Approval
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100% electric
DRIVE CHANGE
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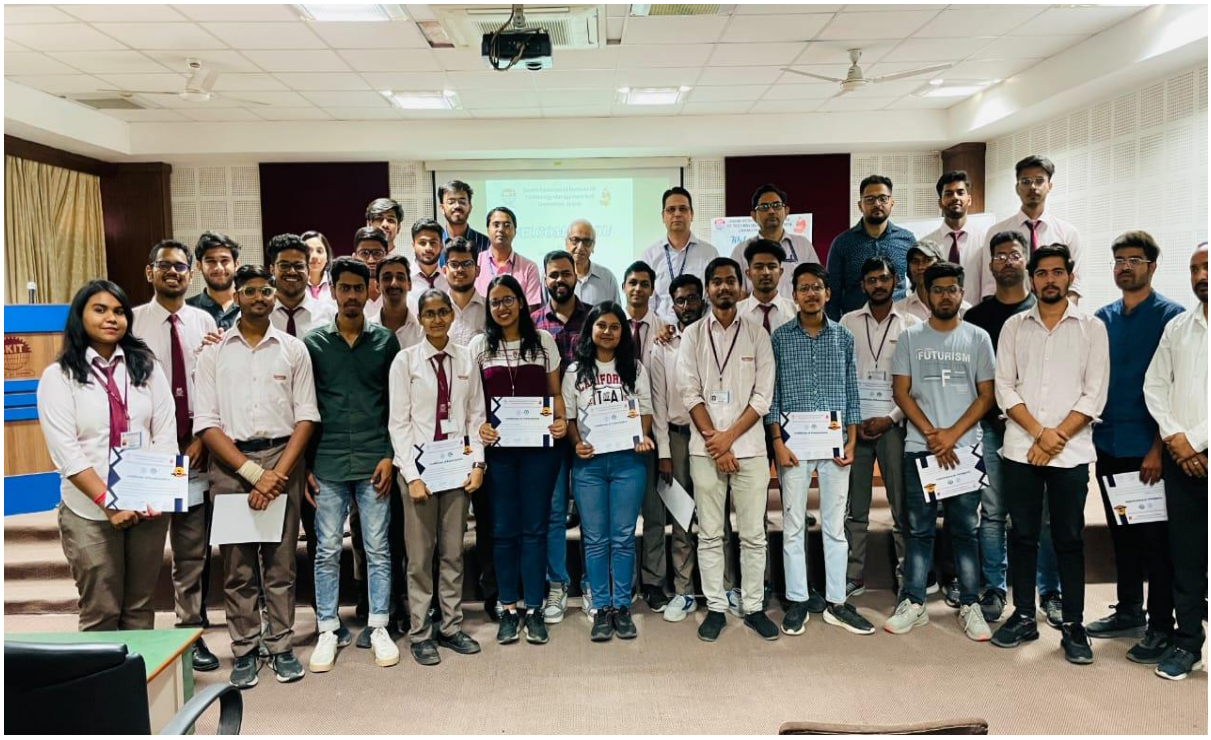
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Incubation cell and Department of Mechanical Engineering

E-Vehicles Workshop

S. No.	Roll No.	Name	Sem.	Cont. No.	Attendance											
					23-03-2023 Date	24-03-2023 Date	27-03-2023 Date	28-03-2023 Date	29-03-2023 Date	31-03-2023 Date	01-04-2023 Date	03-04-2023 Date	04-04-2023 Date	05-04-2023 Date	06-04-2023 Date	07-04-2023 Date
1	20ESKEE012	Akhil Upadhyaya	6th-EE	7665026776												
2	20ESKEE013	Akshat Jivakar	6th-EE	9784054070												
3	20ESKEE015	Anjali Thakur	6th-EE	9001389356												
4	20ESKEE018	Anshit Kumar	6th-EE	9929087620												
5	20ESKEE019	Anurag Kumar	6th-EE	9571046860												
6	20ESKEE042	Himanshu	6th-EE	9571283848												
7	20ESKEE052	Kartik Soni	6th-EE	7976928339												
8	20ESKEE056	Krati Lakhani	6th-EE	8058342019												
9	20ESKEE073	Mookal Raj Gothwal	6th-EE	8769994136												
10	20ESKEE094	Pulkit Gupta	6th-EE	7850841845												
11	20ESKEE096	Jayesh Chhawachhania	6th-EE	7300172023												
12	20ESKEE108	Rishank Mittal	6th-EE	9079350560												
13	20ESKME001	Aayushman Mishra	6th-ME	6376977580												
14	20ESKME010	Amit Jetwani	6th-ME	7976232442												
15	20ESKME014	Anshul Sharma	6th-ME	9672964954												
16	20ESKME016	Arun Kumar Jharwal	6th-ME	9024469348												
17	20ESKME028	Deepak Jaiman	6th-ME	9982023987												
18	20ESKME034	Divyansh Sharma	6th-ME	8619880029												
19	20ESKME039	Harsh Tulsani	6th-ME	8387010438												
20	20ESKME040	Harshit Kumawat	6th-ME	9887059805												
21	20ESKME045	Jeeval Choradia	6th-ME	7976990573												
22	20ESKME046	Jitendra Kumar Meena	6th-ME	8440066888												
23	20ESKME049	Kavita Sharma	6th-ME	9983878999												
24	20ESKME050	Keshav Singh	6th-ME	8696701881												
25	20ESKME058	Mayank Mittal	6th-ME	7014640205												
26	20ESKME068	Priyadarshini	6th-ME	8104742828												
27	20ESKME078	Sachin Sharma	6th-ME	9351436198												
28	20ESKME085	Shyam Kumar	6th-ME	9602823989												
29	20ESKME092	Vishnu Kumar	6th-ME	6367751858												
30	21ESKME007	Bhavya Sharma	6th-ME	9172796944												
31	21ESKME008	Devi Pratap Singh	4th-ME	6375727804												
32	21ESKME024	Rohit Kumar Soni	4th-ME	7597333790												
33	21ESKME200	Shailesh Mali	4th-ME	7737223342												

List of Participants in SWDA (4-8 Apr 2023)

Media Coverage

इलेक्ट्रिक वाहनों पर 10 दिन की कार्यशाला शुरू

जयपुर (का.सं.)। जयपुर के स्वामी केशवानंद इंस्टीट्यूट ऑफ टेक्नोलॉजी में इलेक्ट्रिक वाहनों पर 10 दिन की छात्र कार्यशाला शुरू हुई। यूविक ऑटोमोबाइल्स के सहयोग से यह कार्यक्रम मैकेनिकल इंजीनियरिंग विभाग और इन्क्यूबेशन सेल द्वारा नेतृत्व किया जा रहा है।

कार्यशाला प्रो. धीरज जोशी (हेड, मैकेनिकल इंजीनियरिंग डिपार्टमेंट) और अजय धनोपिया (हेड, इन्क्यूबेशन सेल) द्वारा यूविक ऑटोमोबाइल्स के विशेषज्ञ और छात्रों का स्वागत करने से शुरू हुई।

यह कार्यशाला मैकेनिकल और इलेक्ट्रिकल इंजीनियरिंग के छात्रों को इलेक्ट्रिक वाहन और उनकी तकनीकों की एक व्यापक समझ प्रदान करने का उद्देश्य रखती है। इसमें इलेक्ट्रिक वाहन की वास्तुशिल्प, बैटरी प्रबंधन प्रणाली, चार्जिंग इंफ्रास्ट्रक्चर और पावर इलेक्ट्रॉनिक्स जैसे विषयों को शामिल किया जाएगा। कार्यशाला में हैंड्स-ऑन सेशन के दौरान छात्रों को इलेक्ट्रिक वाहन के प्रोटोटाइप डिजाइन करने और बनाने का मौका देंगे। कार्यशाला के समन्वयक कार्यशाला के समन्वयक डॉ. चंदन कुमार, एसोसिएट प्रोफेसर, मैकेनिकल इंजीनियरिंग विभाग ने कहा कि यह पहल विभाग के अगली पीढ़ी के इलेक्ट्रिक वाहन इंजीनियरों के लिए एक मजबूत नींव रखने के निरंतर प्रयास का हिस्सा है। कार्यशाला के लिए यूविक कंपनी सबसे उपयुक्त साथी के रूप में मानी जाती है। यह उम्मीद की जाती है कि कार्यशाला शैक्षिणक और उद्योग के बीच की दूरी को कम करेगी, विद्यार्थियों को उन योग्यताओं और ज्ञान से परिपूर्ण करेगी, जो इलेक्ट्रिक वाहन के क्षेत्र में देश का भविष्य बनने के लिए आवश्यक होंगे।

इलेक्ट्रिक वाहनों पर 10 दिनी कार्यशाला

जयपुर. स्वामी केशवानंद इंस्टीट्यूट ऑफ टेक्नोलॉजी में इलेक्ट्रिक वाहनों पर 10 दिन की छात्र कार्यशाला शुरू हुई। यह कार्यक्रम यूविक ऑटोमोबाइल्स के सहयोग से मैकेनिकल इंजीनियरिंग विभाग और इन्क्यूबेशन सेल की ओर से नेतृत्व किया जा रहा है। कार्यशाला प्रो. धीरज जोशी (हेड, मैकेनिकल इंजीनियरिंग डिपार्टमेंट) और अजय धनोपिया (हेड, इन्क्यूबेशन सेल) की ओर से यूविक ऑटोमोबाइल्स के विशेषज्ञ और छात्रों का स्वागत करने से शुरू हुई। यह कार्यशाला

मैकेनिकल और इलेक्ट्रिकल इंजीनियरिंग के छात्रों को इलेक्ट्रिक वाहन और उनकी तकनीकों की एक व्यापक समझ प्रदान करने का उद्देश्य रखती है। इसमें इलेक्ट्रिक वाहन की वास्तुशिल्प, चार्जिंग इंफ्रास्ट्रक्चर और पावर इलेक्ट्रॉनिक्स जैसे विषयों को शामिल किया जाएगा।

इलेक्ट्रिक वाहन पर छात्र कार्यशाला का समापन

P3 Police Public Politics

जयपुर । स्वामी केशवानंद इंस्टीट्यूट ऑफ टेक्नोलॉजी में ई-वाहन पर 10 दिवसीय कार्यशाला का समापन सत्र आयोजित किया गया। मैकेनिकल इंजीनियरिंग विभाग और इन्क्यूबेशन सेल एसकेआईटी ने यूवीआईके ऑटोमोबाइल्स के सहयोग से इस महत्वपूर्ण कार्यशाला का नेतृत्व किया। इस कार्यशाला का प्राथमिक उद्देश्य मैकेनिकल और इलेक्ट्रिकल इंजीनियरिंग के छात्रों को इलेक्ट्रिक वाहनों और उनकी तकनीकों की व्यापक समझ प्रदान करना था। वर्कशॉप में इलेक्ट्रिक व्हीकल आर्किटेक्चर, बैटरी मैनेजमेंट सिस्टम, चार्जिंग इंफ्रास्ट्रक्चर और पावर इलेक्ट्रॉनिक्स सहित कई विषयों को शामिल किया गया । छात्र के स्व-निर्मित ई-वाहन के अंतिम प्रदर्शन ने कार्यशाला की भव्य सफलता को चिह्नित किया। कार्यशाला समापन समारोह में अजय धनोपिया (हेड, इन्क्यूबेशन सेल) ने कार्यशाला में हुए कार्य को बताया। समापन समारोह में एसकेआईटी के डायरेक्टर (अकादमिक) प्रो. एस एल सुराणा ने सभी छात्रों को ई-वाहन

के फ्यूचर के बारे में बताया और उनका उत्साह बढ़ाया। कार्यक्रम के अंत में मैकेनिकल इंजीनियरिंग डिपार्टमेंट के विभागाध्यक्ष, डॉ. धीरज जोशी, ने सभी प्रतिभागियों का धन्यवाद ज्ञापित किया। कार्यक्रम का संचालन मैकेनिकल इंजीनियरिंग डिपार्टमेंट के एसोसिएट प्रोफेसर डॉ. चन्दन कुमार ने किया।

ई-वाहन पर कार्यशाला

जयपुर(सीमा सन्देश)। यहां एसकेआईटी (स्वामी केशवानंद इस्टीट्यूट ऑफ टेक्नोलॉजी) में ई-वाहन पर आयोजित 10 दिवसीय कार्यशाला सम्पन्न हो गई। यूवीआईके ऑटोमाबाइल्स के सहयोग से यह महत्वपूर्ण कार्यशाला हुई। इसका प्राथमिक उद्देश्य मैकेनिकल और इलेक्ट्रिकल इंजीनियरिंग के छात्रों को इलेक्ट्रिक वाहनों और उनकी तकनीकों की व्यापक समझ प्रदान करना था। वर्कशॉप में इलेक्ट्रिक व्हीकल आर्किटेक्चर, बैटरी मैनेजमेंट सिस्टम, चार्जिंग इंफ्रास्ट्रक्चर और पावर इलेक्ट्रॉनिक्स सहित कई विषयों को शामिल किया गया। छात्र के स्व-निर्मित ई-वाहन के अंतिम प्रदर्शन ने कार्यशाला की भव्य सफलता को चिह्नित किया।

समापन समारोह में अजय धनोपिया (हेड, इन्क्यूबेशन सैल) ने कार्यशाला में हुए कार्य को बताया। एसकेआईटी के डायरेक्टर (अकादमिक) प्रो. एसएल सुराणा ने सभी छात्रों को ई-वाहन के फ्यूचर के बारे में बताया और उनका उत्साह बढ़ाया। अंत में मैकेनिकल इंजीनियरिंग विभागाध्यक्ष, डॉ. धीरज जोशी ने धन्यवाद ज्ञापित किया। संचालन एसोसिएट प्रोफेसर डॉ. चन्दन कुमार ने किया।

Swami Keshvanand Institute of Technology
Management & Gramothan, Jaipur

Student Workshop on Electric Vehicle Conversion

Certificate of Participation

Ref. No.: SKIT/EVC/2023/20ESKEE073

This is to certify that Mookal Raj Gothwal of VI-EE has successfully completed the two weeks student workshop on **Electric Vehicle Conversion** dated from 23rd March, 2023 to 06th April, 2023 organized by Department of Mechanical Engineering and Incubation Cell SKIT, Jaipur in association with UVIK Automobile.

Dr. Chandan Kumar	Prof. Dheeraj Joshi	Ajay Dhanopia	Kartik Muhal
Coordinator	Convener	Convener	Managing Director
Faculty , ME Deptt.	Head-ME Deptt.	Head-Incubation Cell	UVIK Automobile

Sample of Certificate