



DEPARTMENT OF MECHANICAL ENGINEERING

REPORT ON "SKILL ADVANCED COURSE"

Event Type : Skill Advanced Course
Date/Duration : 17-09-2024 to 21-08-2024 (Online) &
23-09-2024 to 28-09-2024(Offline) (Two weeks)
Name of the Event : Electric & Solar Vehicle-Design & Development
Resource Person : Mr.K.P. Reigen, Administrative Officer in AMZ Industries.
: Mr. Rahul Ranjan, Chief Manager, AMZ Automotive,
Jaipur
: Mr. A.F. Baggio, Chief Technical Officer at AMZ Automotive.

Name of the Coordinator : Mr. S. Rami Reddy, Sr. Assistant Professor.

Target Audience : B. Tech-V Semester

Total Number of students : 109

Objective of the Events : To get Electric and solar vehicle design and development skills.

Outcome of the Event : Students acquired more knowledge on electrical and solar vehicle design and development and applied to core related example.

Description/Report on Event : The Mechanical Engineering Department conducted two weeks skill advanced course on electrical and solar vehicle design and development for V Semester Students from 17-09-2024 to 21-09-2024 (Online) & 23-09-2024 to 28-09-2024 (Offline) in association with AMZ Techversity. During the training sessions, the students got the knowledge on the following topics.

Introduction to Electric Vehicles

- **History of EVs:** Early developments to modern innovations.
- **Types of EVs:** BEV (Battery Electric Vehicle), PHEV (Plug-in Hybrid), HEV (Hybrid Electric Vehicle).
- **EV Architecture:** Overview of EV components (motor, battery, controller, inverter, etc.).
- **Environmental Impact:** Benefits and sustainability factors.
- **Current Market Trends:** Global and regional EV markets.

Electric Vehicle Systems & Components

- **Electric Motors:** Types of motors used in EVs (Induction vs. Permanent Magnet).
- **Powertrain Design:** How the electric powertrain differs from traditional ICE vehicles.
- **Battery Technologies:** Lithium-Ion, Solid State, and emerging technologies.
- **Energy Storage and Management:** Battery management systems (BMS), charging protocols.

Charging Infrastructure and Technologies

- **Types of Charging:** Slow, fast, and rapid charging.
- **Charging Standards:** CHAdeMO, CCS, Type 1/2, and wireless charging.
- **Grid Integration:** How EVs interact with the power grid.
- **Challenges in Charging Networks:** Public vs. home charging, infrastructure development.

EV Regulations, Safety, and Testing

- **Government Policies and Incentives:** Incentives, subsidies, and tax benefits.
- **Safety Standards and Protocols:** Crash testing, fire prevention, and high-voltage safety.
- **Testing and Validation:** Performance, range, durability, and safety testing procedures.

Future Trends and Technologies

- **Autonomous EVs:** Role of AI and machine learning in EV development.
- **Wireless and Solar Charging:** Emerging trends.
- **Recycling and Reuse of Batteries:** Circular economy in EVs.
- **Advanced Battery Technologies:** Solid-state, fast-charging, and energy-dense batteries.

Familiarization with EV Components

- **Disassembly of EV Parts:** Hands-on exploration of motor, battery, controller, etc.
- **Practical Study of Electric Motor:** Understanding and analyzing motor specifications and performance.
- **Battery Inspection and Testing:** Basic handling of EV batteries and performance metrics.

EV Diagnostics and Troubleshooting

- **Vehicle Diagnosis Tools:** Use of OBD-II scanners, multimeters, etc.
- **Electrical Fault Diagnosis:** Identifying common faults in wiring and electronics.
- **Battery Health Assessment:** Practical tools to measure battery degradation.

Charging Infrastructure Setup

- **Setting Up a Charging Station:** Practical experience in setting up home and public charging stations.
- **EV Charger Maintenance:** Tools and techniques for regular upkeep.
- **Charging Protocols:** How to charge EVs properly and safely.

Hands-On EV Assembly and Disassembly

- **EV Assembly:** Reassembling the disassembled parts from Day 6.
- **Controller and Powertrain Setup:** Wiring and installing the controller to the motor and battery.
- **Safety Protocols:** Implementing safety practices during assembly and operation.

Performance Evaluation

- **Software Tuning:** Adjusting software for better efficiency or power.
- **Feedback and Assessment:** Performance evaluation and troubleshooting real-world driving issues.

Test Driving

- **EV Test Drive:** Analyze vehicle performance, efficiency, and driving dynamics.

Feedback/ Suggestions: Overall students are satisfied with this training program.

Two Weeks Skill Advanced Course Brochure: -

About the Institute

The Lakireddy Bali Reddy College of Engineering (LBRCE) was established in the year 1998 by Lakireddy Bali Reddy Charitable Trust, whose architect is Er. Lakireddy Bali Reddy garu. The institute is established with the sole aim of providing high quality educational opportunities in the field of science, engineering, technology and management. It is spread over 60 acres of sprawling lush green landscape spotted with orchids and grooves. It is approved by AICTE, affiliated to JNTUK, Kakinada and attained autonomous status in the year 2010. Institute has NAAC accreditation and almost five programs were accredited under NBA-Tier1. The College has also been awarded 2(F) and 12(B) status, apart from the recognition as a "College with Potential for Excellence (CPE)" from the UGC.

LBRCE has sophisticated infrastructure with dedicated, well qualified and experienced faculty. A separate R&D cell is established in the college to focus on continuous research. has various sponsored research projects by various funding agencies. All laboratories are equipped with state-of-the-art facilities backed by advanced computer systems with latest software. Recently Institute has started the Advanced Robotic Control (ARC) centre in association with German Collaboration.

About the Department

Mechanical Engineering is one of the major disciplines in the engineering profession and its principles are involved in the thermal, design and fabrication of nearly all of the physical devices and systems. Continued research and development have led to better machines and processes helping the mankind.

The Department of Mechanical Engineering has come into existence in LBRCE (Autonomous) in the year 1998. It offers undergraduate program in Mechanical Engineering with an intake of 180 and a Post-graduate program in the area of Thermal Engineering specialization. The Department has well qualified, dedicated faculty with good laboratory facilities including equipment required for

research work. The faculty is actively engaged in research activities in their areas of specialization. In R&D, we got DST and AICTE, MODRABS projects worth of Rs.1 Crore 27 Lakhs. The Department has DASSAULT Systems laboratory in collaboration with AP Skill Development Centre and has ANSYS 18.1 Licensed Software worth of Rs.28Lakhs for 300 users to carry out research works

About the Workshop

Electric Vehicles (EVs) offer a significant solution to the global fuel crisis and environmental pollution in the transportation sector. This program is designed to present the latest trends and advancements in EV technology. It will cover both theoretical aspects and provide hands-on experience to participants. The program aims to foster industry and academic collaborations by addressing current research challenges. Participants will be introduced to the fundamentals of EVs, including components such as cables, batteries, drives, and controllers. They will receive practical training to gain in-depth insights into the automotive domain and explore the feasibility and future scope of EVs.

Workshop Objective

The course is designed to provide in depth understanding of Electric Vehicle Design Methodology and Optimization for commercial use

Highlights of the Training

- ❖ E-Vehicle Architecture Design.
- ❖ Optimization of Components of power Train.
- ❖ Structure Design for E-Vehicle
- ❖ Battery Development and Scope of Research.
- ❖ Retrofitting of the Vehicle

LAKIREDDY BALI REDDY COLLEGE OF
ENGINEERING (AUTONOMOUS)
MYLAVARAM – 521 230
DEPARTMENT OF MECHANICAL ENGINEERING
IN ASSOCIATION WITH
AMZ TECHVERSITY



Two Weeks Skill Advanced Course on
"Electric & Solar Vehicle- Design and
Development"

(17th to 21st September 2024 Online)
(23rd to 28th September 2024 Offline)

Registration Form

1. Name: _____
2. Regd.No: _____
3. Year of Study: _____
4. Branch: _____
5. Institution: _____
6. Address for Correspondence _____
7. Phone no: _____
8. E-Mail: _____

Declaration

The above information provided is true to the best of my knowledge. I agree to abide by the rules and regulations of the workshop course.

Place: _____

Date: _____ Signature of Applicant

Sponsorship Certificate

Mr./Ms. _____
is a student of our Institute and is hereby sponsored to participate in One Week workshop on "Electric & Solar Vehicle- Design and Development"

Place: _____

Date: _____ Signature of Head of Institution
(With seal)

COMMITTEE MEMBERS

Chief Patron:

Sri. Lakireddy Jaya Prakash Reddy
Honorary Chairman
Sri. Lakireddy Prasad Reddy
Chairman
Sri.L.Vijaya Kumar Reddy
Vice -Chairman

Patron:

Sri. G. Srinivasa Reddy
President
Dr. K.Appa Rao
Principal
Dr.B. Ramesh Reddy
Vice principal

Advisor:

Dr.M.Srinivasa Rao
Dean Academics
Dr. S. Pichi Reddy
Professor & Dean , R&D

Convener:

Dr.M.B.S. Sreevara Reddy
Professor & HOD

Coordinator:

Mr. S.Rami Reddy
Sr. Assistant Professor

Important Dates

Last date for submission of application: 14-09-2024

Duration of Program: 17th to 21st September 2024 Online
23rd to 28th September 2024 Offline

Resource Persons:

1. Mr.K.P. Reigen, Administrative Officer in AMZ Industries.
2. Mr.Rahul Ranjan, Chief Manager at AMZ Automotive, Jaipur.
3. Mr. A.F. Baggio, Chief Technical Officer at AMZ Automotive.

Target Audience

The workshop is open to all third year B.Tech Graduate students of AICTE approved engineering colleges.

Registration Particulars

Application in the prescribed format duly sponsored by the Head of the Institution should reach the coordinators on or before 14-09-2024

Note: Brochure & registration form can also be downloaded from our college website.
<http://www.lbrce.ac.in>

Registration Fee

For Each Student: Rs.1000/-

- ❖ Certificate provided for eligible students.

The participants need to pay the registration fee preferably through online in the given bank account. The receipt of payment details may be sent to the email: ramireddy.mec@gmail.com

Account Name	LBRCE
Account Number	3172828720
Branch	Central bank of India, L.B. Reddy Nagar, Mylavaram
IFSC	CBIN0283964

Two Weeks Skill Advanced Course on
"Electric & Solar Vehicle- Design and
Development"

(17th to 21st September 2024 Online)
(23rd to 28th September 2024 Offline)



ORGANIZED BY

DEPARTMENT OF MECHANICAL ENGINEERING



IN ASSOCIATION WITH
AMZ TECHVERSITY



LAKIREDDY BALI REDDY COLLEGE OF
ENGINEERING (AUTONOMOUS)

Approved by AICTE, New Delhi and Affiliated to
JNTUK, Kakinada, Accredited by NAAC, Accredited by
NBA (Tier-I), ISO 9001:2015 Certified Institution,

Mylavaram -521230, Krishna (Dt),
Andhra Pradesh, India,

Ph: 08659-222933. Fax: 08659-222931

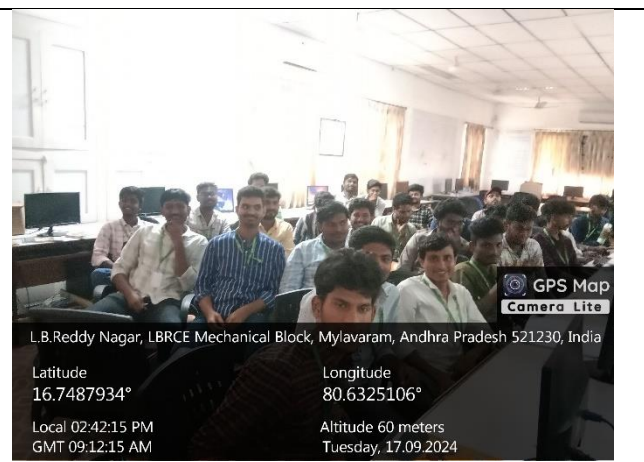
Website: www.lbrce.ac.in

Day To Day Report

17/09/2024: Afternoon Session (01:00 PM to 05:00 PM)

Day 1: Introduction to Electric Vehicles

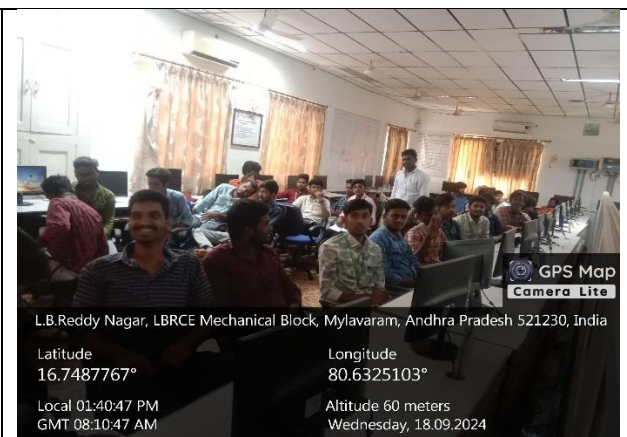
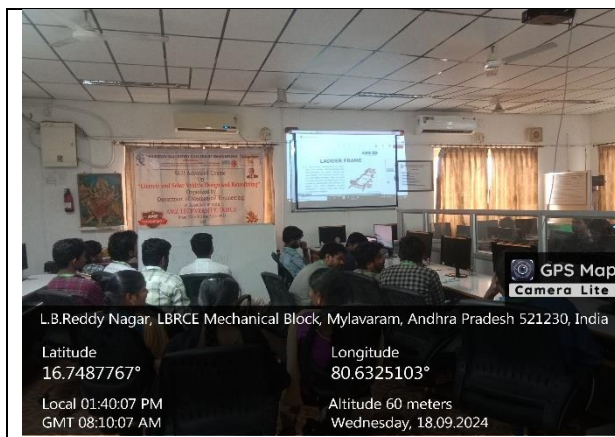
- **History of EVs:** Early developments to modern innovations.
- **Types of EVs:** BEV (Battery Electric Vehicle), PHEV (Plug-in Hybrid), HEV (Hybrid Electric Vehicle).
- **EV Architecture:** Overview of EV components (motor, battery, controller, inverter, etc.).
- **Environmental Impact:** Benefits and sustainability factors.
- **Current Market Trends:** Global and regional EV markets.



18/09/2024: Afternoon Session (01:00 PM to 05:00 PM)

Day 2: Electric Vehicle Systems & Components

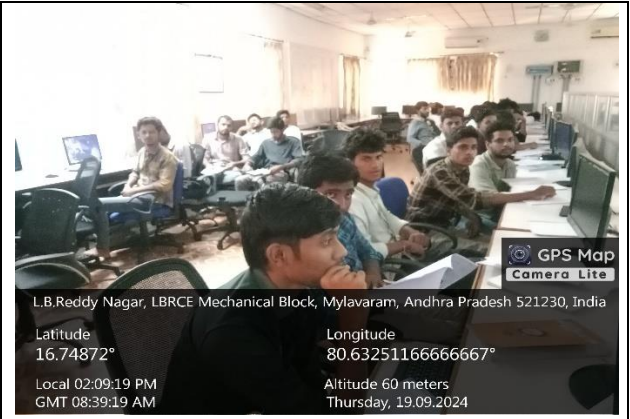
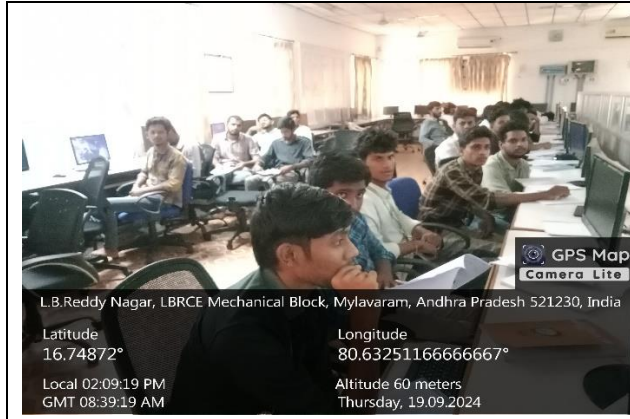
- **Electric Motors:** Types of motors used in EVs (Induction vs. Permanent Magnet).
- **Powertrain Design:** How the electric powertrain differs from traditional ICE vehicles.
- **Battery Technologies:** Lithium-Ion, Solid State, and emerging technologies.
- **Energy Storage and Management:** Battery management systems (BMS), charging protocols.



19/09/2024: Afternoon Session (01:00 PM to 05:00 PM)

Day 3: Charging Infrastructure and Technologies

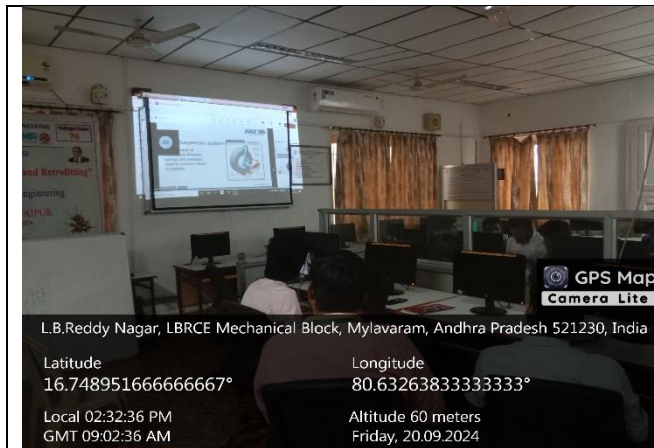
- **Types of Charging:** Slow, fast, and rapid charging.
- **Charging Standards:** CHAdeMO, CCS, Type 1/2, and wireless charging.
- **Grid Integration:** How EVs interact with the power grid.



20/09/2024: Afternoon Session (01:00 PM to 05:00 PM)

Day 4: EV Regulations, Safety, and Testing

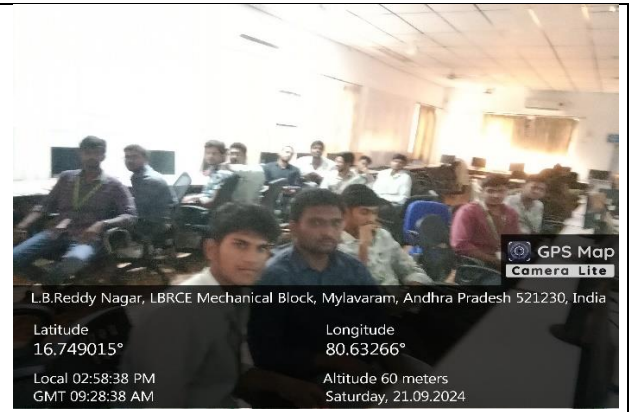
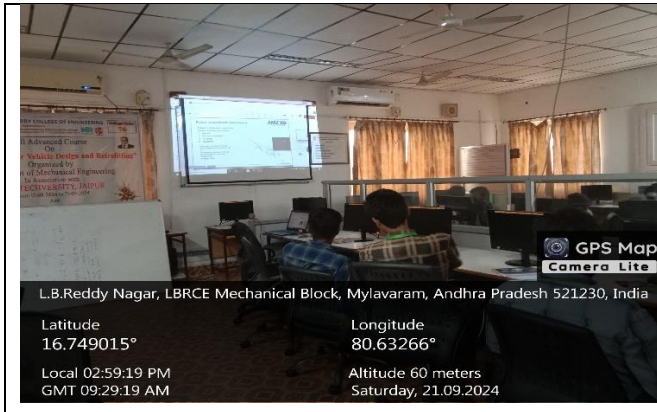
- **Government Policies and Incentives:** Incentives, subsidies, and tax benefits.
- **Safety Standards and Protocols:** Crash testing, fire prevention, and high-voltage safety.
- **Testing and Validation:** Performance, range, durability, and safety testing procedures.



21/09/2024: Afternoon Session (01:00 PM to 05:00 PM)

Day 5: Future Trends and Technologies

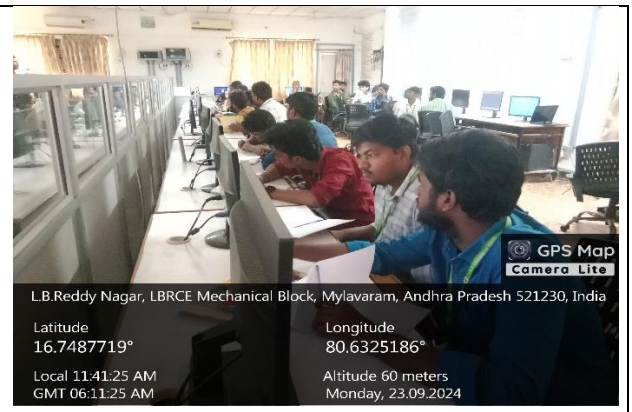
- **Autonomous EVs:** Role of AI and machine learning in EV development.
- **Wireless and Solar Charging:** Emerging trends.
- **Recycling and Reuse of Batteries:** Circular economy in EVs.
- **Advanced Battery Technologies:** Solid-state, fast-charging, and energy-dense batteries.



23/09/2024: (09:00PM to 05:00PM)

Day 6: Familiarization with EV Components

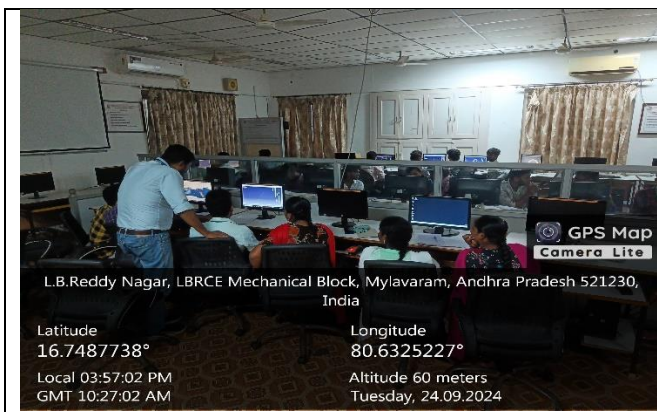
- **Disassembly of EV Parts:** Hands-on exploration of motor, battery, controller, etc.
- **Practical Study of Electric Motor:** Understanding and analyzing motor specifications and performance.
- **Battery Inspection and Testing:** Basic handling of EV batteries and performance metrics.



24/09/2024: (09:00PM to 05:00PM)

Day 7: EV Diagnostics and Troubleshooting

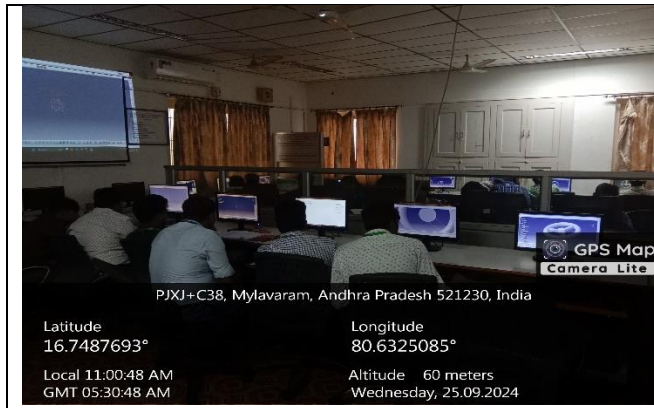
- **Vehicle Diagnosis Tools:** Use of OBD-II scanners, multimeters, etc.
- **Electrical Fault Diagnosis:** Identifying common faults in wiring and electronics.
- **Battery Health Assessment:** Practical tools to measure battery degradation.



25/09/2024: (09:00PM to 05:00PM)

Day 8: Charging Infrastructure Setup

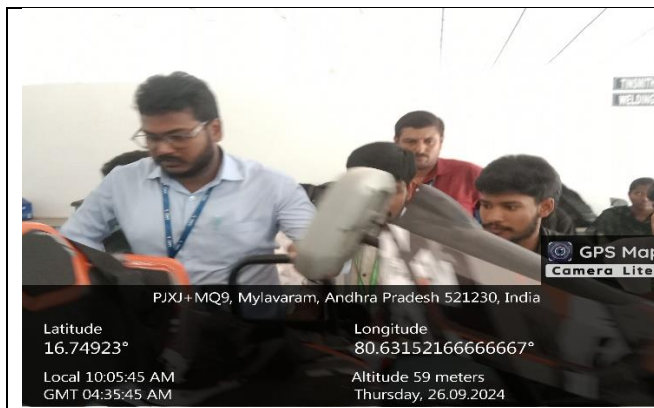
- **Setting Up a Charging Station:** Practical experience in setting up home and public charging stations.
- **EV Charger Maintenance:** Tools and techniques for regular upkeep.
- **Charging Protocols:** How to charge EVs properly and safely.



26/09/2024: (09:00PM to 05:00PM)

Day 9: Hands-On EV Assembly and Disassembly

- **EV Assembly:** Reassembling the disassembled parts from Day 6.
- **Controller and Powertrain Setup:** Wiring and installing the controller to the motor and battery.
- **Safety Protocols:** Implementing safety practices during assembly and operation.



27/09/2024: (09:00PM to 05:00PM)

Day 10: Test Driving and Performance Evaluation

- **EV Test Drive:** Analyze vehicle performance, efficiency, and driving dynamics.
- **Software Tuning:** Adjusting software for better efficiency or power.
- **Feedback and Assessment:** Performance evaluation and troubleshooting real-world driving issues.



28/09/2024: (09:00PM to 05:00PM)

Day 11: Test Driving

- **EV Test Drive:** Analyze vehicle performance, efficiency, and driving dynamics.



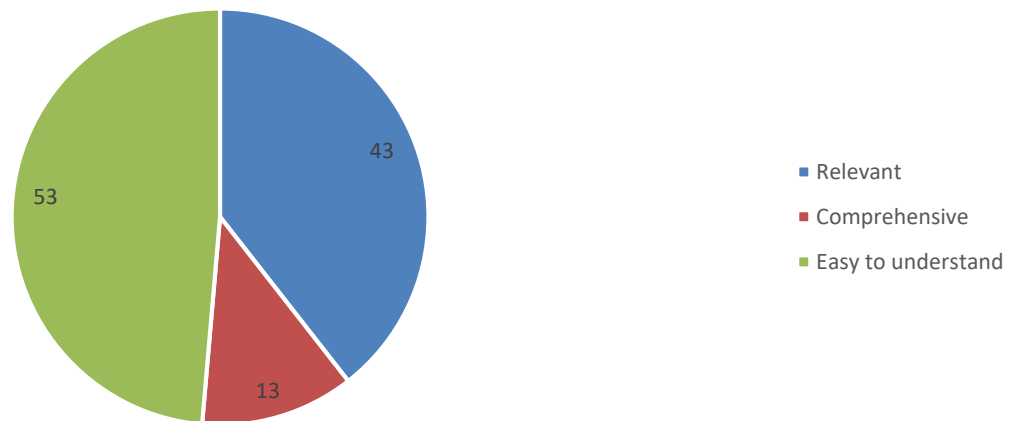
Feedback / Suggestions:

1. The course offered valuable insights into electric vehicles, which greatly enhanced understanding for further studies.
2. The Electric Vehicle (EV) course provided significant benefits for students studying Mechanical Engineering.
3. The course significantly enhanced the understanding of the core principles of electric vehicles.
4. Hands-on experience in assembling and disassembling electric vehicles facilitated the acquisition of knowledge.

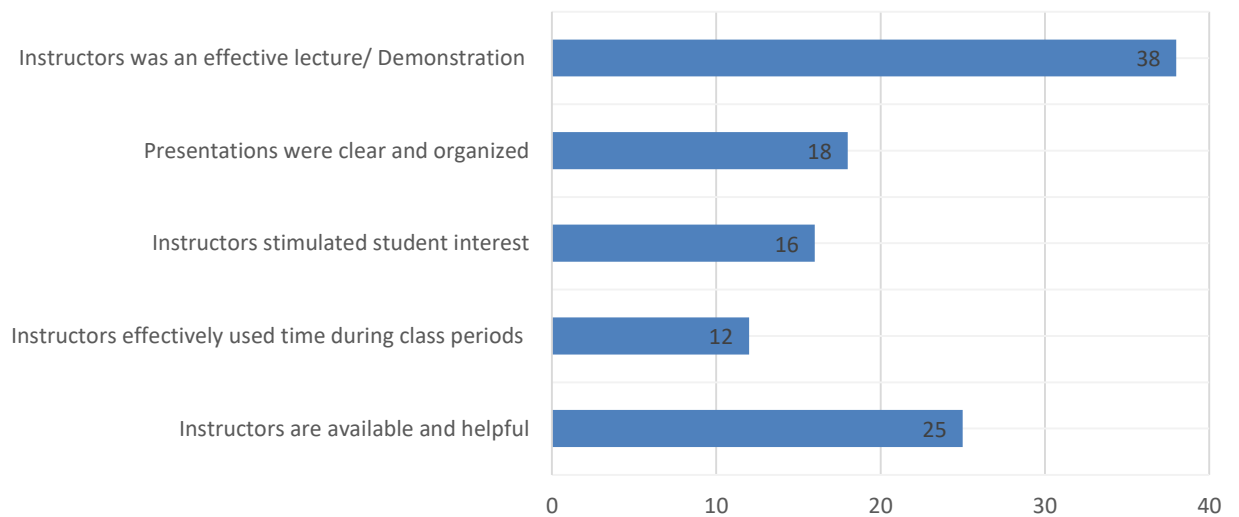
Feedback Report: The student participants gave their feedback on the two weeks' workshop and the responses were shown in the form of graph given below

Feedback from the participants:

1.The workshop content was
109 responses

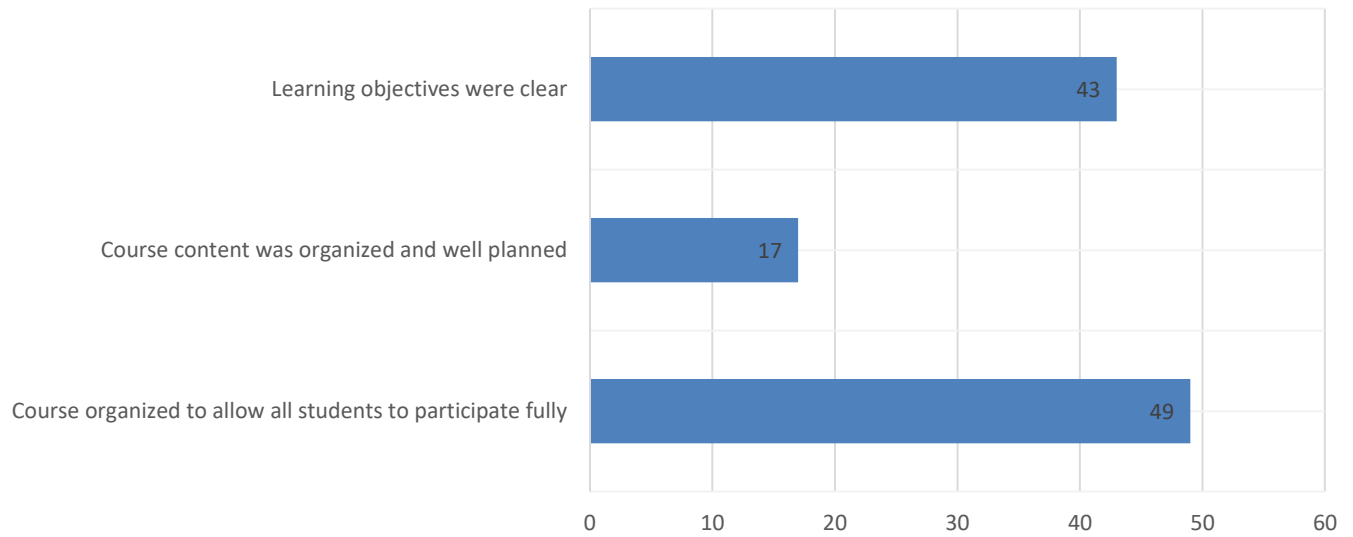


2. Skill and response of the instructors
109 responses



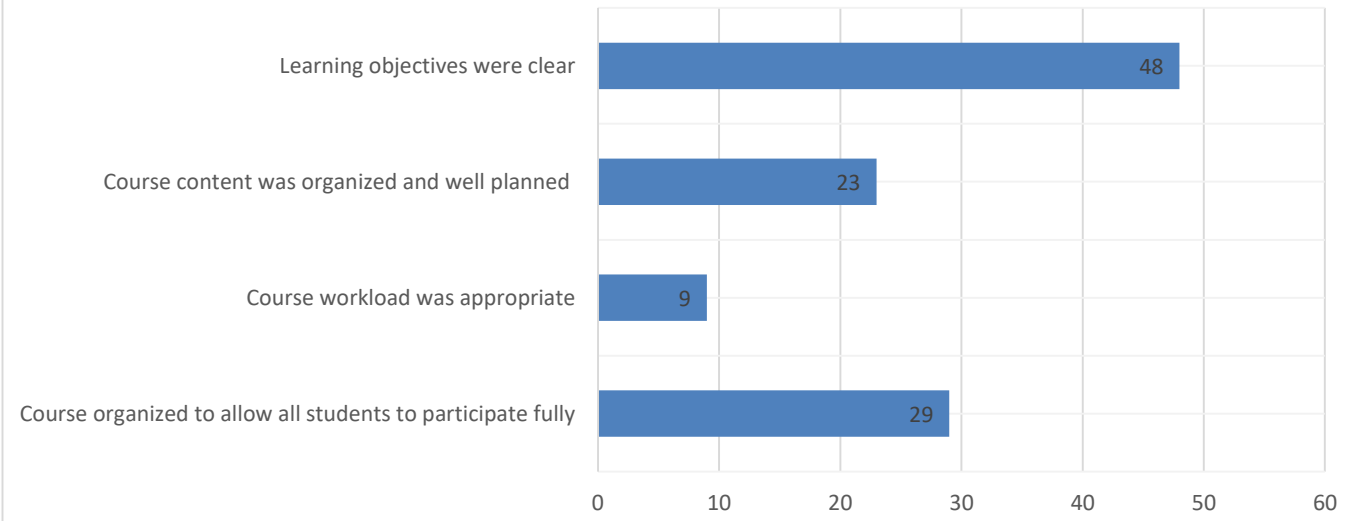
3. Course content

109 responses



4. What aspects of this course were most useful or valuable

109 responses

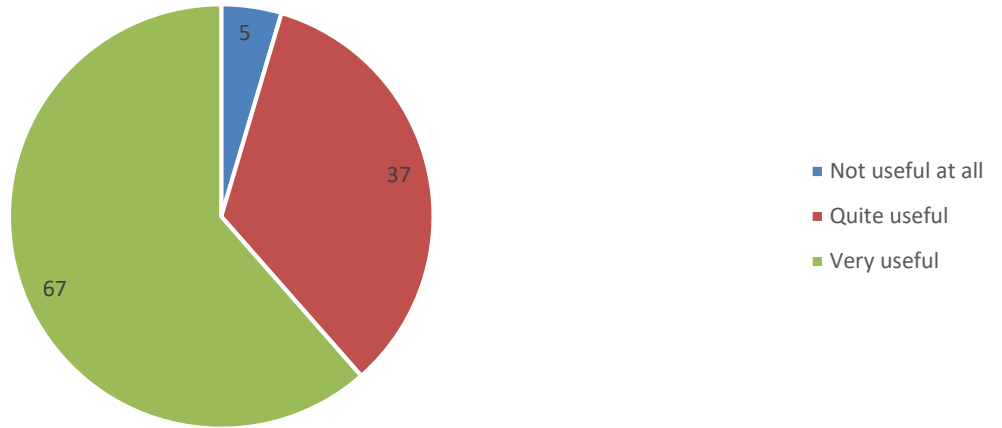


5. What Aspects of this course were most useful or Valuable.

- Very helpful to work in manufacturing industry
- Partially useful or valuable
- It may useful for job & industry
- E.V improve the presentation skills
- Thinking capability
- Explaining about parts of machines and assembly & disassembly
- Understanding of Electric Vehicle circuits
- How electric & solar vehicle works
- Project Management Skills
- Explaining content of E.V

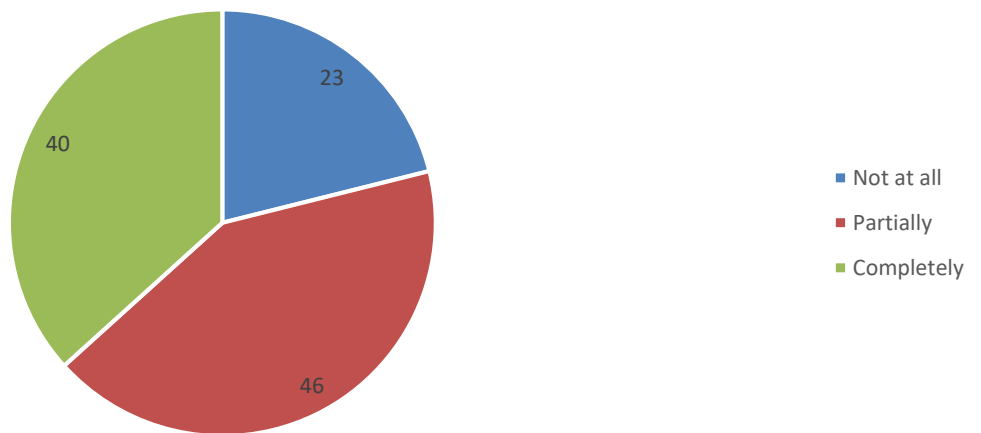
6. Did you find the training program useful?


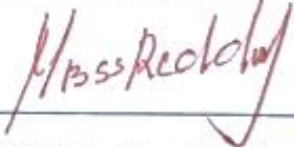
109 responses



7. Did it cover what you were expecting?

109 responses



Signature		
	Mr. S. Rami Reddy	Dr. M.B.S. Sreevara Reddy
	Name of the coordinator	HEAD Head of the Department

HEAD
Head of the Department
Dept. of Mechanical Engineering
LAKIREDDY BALI REDDY COLLEGE OF ENGG.
MYLAVARAM-521 230, KRISHNA DT, A.P