



# PRAGATI ENGINEERING COLLEGE

(AUTONOMOUS)

# 1-378, ADB Road, Surampalem, E.G. District, A.P. 533 437.  
(Approved by AICTE & Permanently Affiliated to JNTU Kakinada & Accredited by NBA & NAAC with 'A' Grade)  
(Recognized by U.G.C. under sections 2(f) & 12(b) of the U.G.C. Act, 1956)

Ph : (08852) 252233, 252234, 252235, Fax : 252232, Website : www.pgarati.ac.in  
(Sponsored by Gayatri Educational Society)

D No.2-46-21, Near D Mart, Kakateeya Nagar, Kakinada. Ph (0884) 2355900, Fax : 2363900

Academic Year : 2023-24

Date : 23.04.2024

## CIRCULAR

We are happy to inform you that the Lecture on **"Hands on EV Modeling"** is scheduled to be conducted by Electric Vehicles Club. The lecture will be delivered by Mr. T. Balaji (21A31A0256) of III-EEE-B.

Interested students can participate in the event as per the schedule time below at Mechanical Block MS-10.

**Date & Time of Event** : 24.04.2024 @ 02:00 – 04:00 PM.

**Venue** : Mechanical Block – MS-10

*T. Balaji*  
HOD-EEE





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## ELECTRICAL VEHICLES CLUB REPORT

Title: Hands-On EV Modeling: A Comprehensive Guide

### 1. Introduction

- Overview of Electric Vehicles (EVs)
- Importance of Modeling in EV Development

### 2. Understanding EV Components

- Battery Pack
- Electric Motor
- Power Electronics
- Vehicle Dynamics

### 3. Types of EV Models

- Energy-Based Models
- Physics-Based Models
- Data-Driven Models

### 4. Tools and Software for EV Modeling

- MATLAB/Simulink
- ADVISOR
- Open-Source Tools (e.g., OpenModelica)

### 5. Hands-On Approach to EV Modeling

- Setting up a Simulation Environment
- Modeling Battery Behavior
- Modeling Electric Motor Performance
- Integrating Power Electronics
- Simulating Vehicle Dynamics

### 6. Challenges and Considerations

- Accuracy vs. Computational Complexity
- Validation and Calibration of Models
- Real-World Data Integration

### 7. Case Studies

- Modeling a Battery Electric Vehicle (BEV)
- Modeling a Plug-In Hybrid Electric Vehicle (PHEV)
- Model Validation with Experimental Data

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## 8. Future Trends and Opportunities

- Advances in Battery Technology
- Integration of Autonomous Features
- Electrification of Different Vehicle Types

## 9. Conclusion

- Summary of Key Points
- Importance of Hands-On EV Modeling in Future Developments

Feel free to expand on each section with detailed information, examples, and case studies as needed. Let me know if you need further assistance with any specific part!

1. Introduction: Provide an overview of electric vehicles and why modeling is crucial in their development, highlighting its role in design optimization, performance prediction, and energy efficiency analysis.

2. Understanding EV Components: Detail the key components of an electric vehicle, including the battery pack, electric motor, power electronics, and vehicle dynamics, explaining their functions and interactions.

3. Types of EV Models: Describe different approaches to EV modeling, such as energy-based models (focused on energy flow analysis), physics-based models (based on fundamental principles of physics), and data-driven models (utilizing empirical data and machine learning techniques).

4. Tools and Software for EV Modeling: Discuss popular tools and software used for EV modeling, such as MATLAB/Simulink for system-level simulations, ADVISOR for vehicle modeling and simulation, and open-source tools like OpenModelica for flexible and customizable modeling.

5. Hands-On Approach to EV Modeling: Outline the steps involved in setting up a simulation environment and modeling various aspects of an electric vehicle, including battery behavior, electric motor performance, power electronics integration, and vehicle dynamics simulation.

6. Challenges and Considerations: Address challenges in EV modeling, such as balancing accuracy with computational complexity, validating and calibrating models using real-world data, and integrating diverse modeling techniques for comprehensive analysis.

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7. Case Studies: Present real-world examples of EV modeling projects, including modeling a battery electric vehicle (BEV), modeling a plug-in hybrid electric vehicle (PHEV), and validating models using experimental data from test vehicles.
8. Future Trends and Opportunities: Explore emerging trends in EV technology and modeling, such as advancements in battery technology, integration of autonomous features, and the electrification of different vehicle types like trucks and buses.
9. Conclusion: Summarize the importance of hands-on EV modeling in driving future developments in electric vehicle technology, emphasizing its role in accelerating innovation and addressing challenges in sustainable transportation.
10. References: Provide a list of sources and references cited throughout the report for further reading and verification of information.



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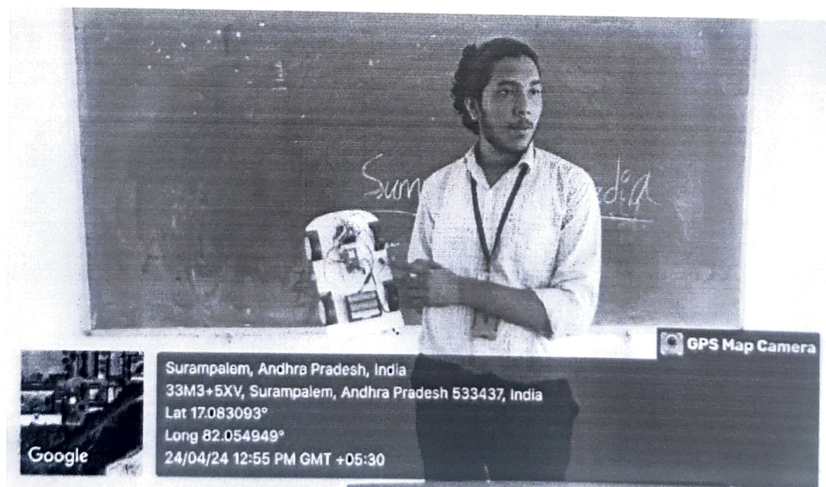
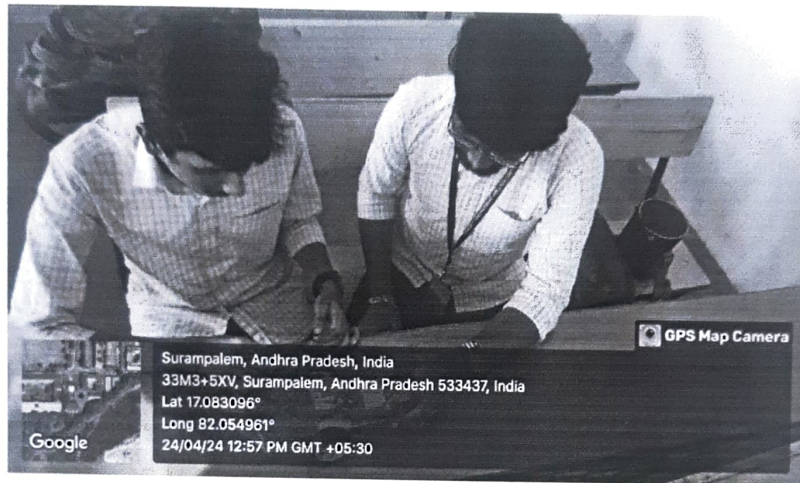
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**Total-32 students participated in this Event**

**Photos:**



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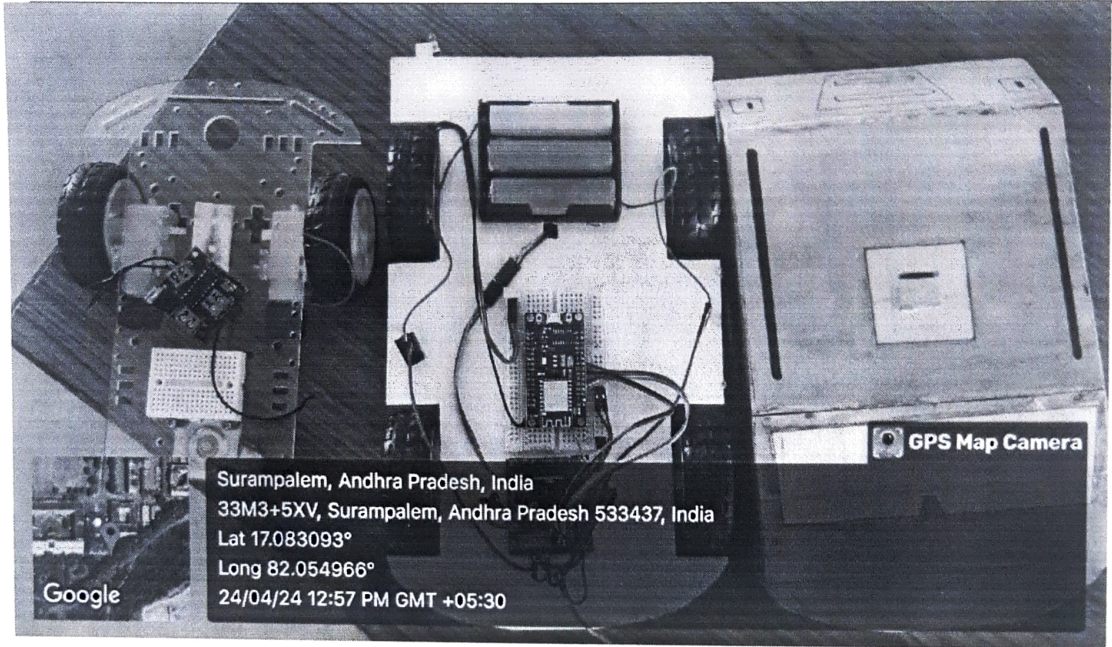
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*M. M. Shankar*  
CLUBCO-ORDINATOR

*P. S. K.*  
HOD-EEE





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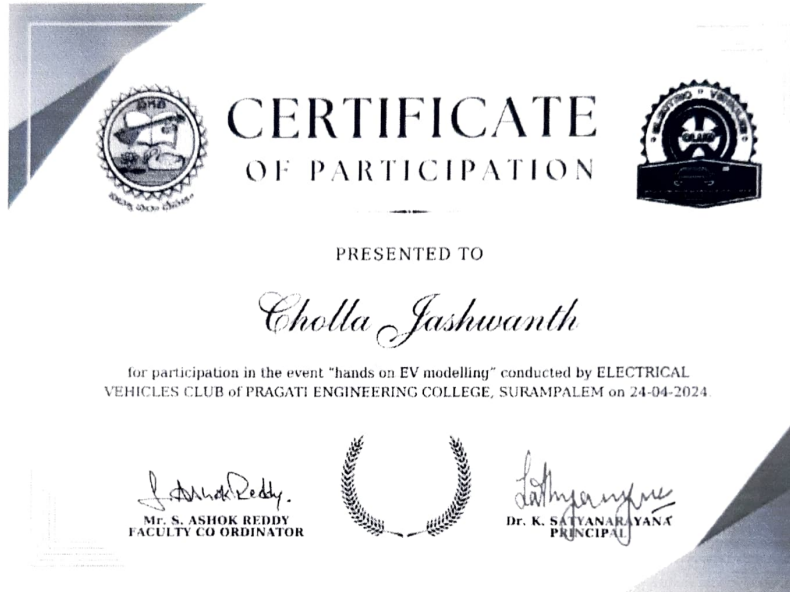
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## Certificates:



**CERTIFICATE OF PARTICIPATION**

PRESENTED TO

*Cholla Jashwanth*

for participation in the event "hands on EV modelling" conducted by ELECTRICAL VEHICLES CLUB of PRAGATI ENGINEERING COLLEGE, SURAMPALAM on 24-04-2024.

Mr. S. Ashok Reddy, Faculty Co Ordinator

Dr. K. Satyanarayana, Principal



**CERTIFICATE OF PARTICIPATION**

PRESENTED TO

*Peta harika*

for participation in the event "hands on EV modelling" conducted by ELECTRICAL VEHICLES CLUB of PRAGATI ENGINEERING COLLEGE, SURAMPALAM on 24-04-2024.

Mr. S. Ashok Reddy, Faculty Co Ordinator

Dr. K. Satyanarayana, Principal



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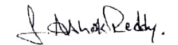
## CERTIFICATE OF PARTICIPATION



PRESENTED TO

*Pendyala rohini*

for participation in the event "hands on EV modelling" conducted by ELECTRICAL VEHICLES CLUB of PRAGATI ENGINEERING COLLEGE, SURAMPALEM on 24-04-2024.

  
MR. S. ASHOK REDDY  
FACULTY CO ORDINATOR



  
DR. K. SATYANARAYANA  
PRINCIPAL




## CERTIFICATE OF PARTICIPATION



PRESENTED TO

*Boda vamsi*

for participation in the event "hands on EV modelling" conducted by ELECTRICAL VEHICLES CLUB of PRAGATI ENGINEERING COLLEGE, SURAMPALEM on 24-04-2024.

  
MR. S. ASHOK REDDY  
FACULTY CO ORDINATOR



  
DR. K. SATYANARAYANA  
PRINCIPAL



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Poster:

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**ELECTRIC VEHICLES CLUB**  
AN INDUSTRY 4.0 CLUB  
OF DEPT OF EEE IN ASSOCIATION WITH THE EEE CELL  
ORGANIZES A TECHNICAL SESSION ON  
**HANDS-ON EV MODELLING**  
**SPEAKER: MD. NOOR MOHAMMED AFRID**  
**DATE: 24/04/24** **VENUE: MS-10**  
**TIME: 2:00 TO 4:00 PM**

**FACULTY COORDINATOR:**  
**S. ASHOK REDDY**  
**(ASST. PROF EEE DEPT)**

**STUDENT COORDINATOR:**  
**P. SRUJANA**



# PRAGATI ENGINEERING COLLEGE

(AUTONOMOUS)  
DEPT. OF ELECTRICAL AND ELECTRONICS ENGINEERING  
ELECTRIC VEHICLES CLUB



Title of the Event :- Hands on EV modeling.

Event No :-

Speaker / Resource person of the Event :-

Date of the Event :- 24-04-2024 Time :- 2:00 to 4:00 PM, Venue :- M/S-10.

### List of students attended

S.NO	ROLL NUMBER	NAME	BRANCH	YEAR	SIGNATURE
1.	22A31A0211	K.Naga Purna Lakshmi	EEE	II	K. Purna
2.	22A31A0203	A.Manjina Srilekshana	EEE	II	A.Manjina
3.	22A31A0206	B. Srivalli	EEE	II	B. Srivalli
4.	22A31A0208	B. Koushika	EEE	II	B. Koushika
5.	22A31A0209	D. Lavanya	EEE	II	D. Lavanya
6.	22A31A0219	P. A.G. Nagavalli	EEE	II	P. Nag
7.	22A31A0212	K. Surya sandhya	EEE	II	K. Surya
8.	22A31A0221	R. Srividya	EEE	II	R. Srividya
9.	22A31A0214	K. Vasuvini sree	EEE	II	K. Vasuvini
10.	22A31A0207	B. S. Santhoshi	EEE	II	B. S. Santhoshi
11.	23A35A0201	A. Jyothsna	EEE	II	A. Jyothsna
12.	23A35A0202	P. Deepika	EEE	II	P. Deepika
13.	22A31A0204	A. Hemalatha	EEE	II	A. Hemalatha
14.	22A31A0223	Y. Sunitha	EEE	II	Y. Sunitha
15.	22A31A0202	A. Niharika	EEE	II	A. Niharika
16.	22A31A0205	A. Sri Vijaya	EEE	II	A. Sri Vijaya
17.	22A31A0220	R. Bavya sri	EEE	II	R. Bavya
18.	22A31A0222	T. Ramya sri	EEE	II	T. Ramya sri
19.	22A31A0217	M. Madhu Latha	EEE	II	Madhu M
20.	23A35A0203	B. Sai Akshay	EEE	II	B. Sai Akshay
21.	23A35A0209	G. Rajesh	EEE	II	G. Rajesh
22.	23A35A0212	M. Vikas	EEE	II	M. Vikas
23.	22A31A0252	T. Siva Subrahmanyam	EEE	II	T. Siva
24.	23A35A0208	G. Naga Sri Sanjiv	EEE	II	G. Naga Sri Sanjiv
25.	23A35A0211	K. Rushi	EEE	II	Rushi
26.	23A35A0213	P. Anilkumar	EEE	II	Anil
27.	23A35A0207	G. Satish	EEE	II	Satish





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DEPT. OF ELECTRICAL AND ELECTRONICS ENGINEERING

## ELECTRIC VEHICLES CLUB



S.NO	ROLL NUMBER	NAME	BRANCH	YEAR	SIGNATURE
28.	22A31A0253	T. Sandeep	EEE	2 <sup>nd</sup>	T. Sandeep
29.	22A31A0227	B. Sita Srinivas	EEE	2 <sup>nd</sup>	B. Sita Srinivas
30.	22A31A0242	M.T.S. Subrahanya	EEE	2 <sup>nd</sup>	M.T.S. Subrahanya
31.	22A31A0228	B. Sri Venkata Siva	EEE	2 <sup>nd</sup>	B.S.V. Siva
32.	22A31A0232	K. Sai Kamal	EEE	2 <sup>nd</sup>	K. S. Kamal
33	22A31A0246	P. Satya Sandeep	EEE	2 <sup>nd</sup>	P. Satya Sandeep
34	22A31A0234	K. Santhosh Kumar	EEE	2 <sup>nd</sup>	K. Santhosh Kumar
35	22A31A0251	R. Harish	EEE	2 <sup>nd</sup>	R. Harish
36	22A31A0224	A. Rajesh	EEE	2 <sup>nd</sup>	A. Rajesh
37	22A31A0239	M. Gangaadri	EEE	2 <sup>nd</sup>	M. Gangaadri
38	22A31A0238	K. Suresh	EEE	2 <sup>nd</sup>	K. Suresh
39	22A31A0248	P. Harsha Vardhan	EEE	2 <sup>nd</sup>	P. Harsha Vardhan
40	22A31A0241	M. Srinivas	EEE	2 <sup>nd</sup>	M. Srinivas
41	22A31A0235	K. Kumaraswamy	EEE	2 <sup>nd</sup>	K. Kumaraswamy
42	23A35A0205	Ch. John Anand Kumar	EEE	2 <sup>nd</sup>	Ch. John Anand Kumar
43	23A35A0215	V. Raj Sri Sai Praneeth	EEE	2 <sup>nd</sup>	V. Raj Sri Sai Praneeth
44	23A35A0214	P. Karthik	EEE	2 <sup>nd</sup>	P. Karthik
45	22A31A0237	K. Jaya Ram	EEE	2 <sup>nd</sup>	K. Jaya Ram
46	22A31A0240	M. Pavan	EEE	2 <sup>nd</sup>	M. Pavan
47	22A31A0245	N. Mahendra	EEE	2 <sup>nd</sup>	N. Mahendra
48	22A31A0250	P. Aravind	EEE	2 <sup>nd</sup>	P. Aravind
49.	22A31A0218	N. Madhavi	EEE	2 <sup>nd</sup>	N. Madhavi