



Two Day's Advance Course on "2 - 3 Wheeler EV Design and Testing for Validation"

by
National Automotive Test Tracks



Dear all,

Greetings from NATRAX !

You are invited to attend an advance course for:

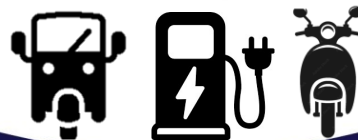
*Assimilation of Knowledge on Fundamentals & Applications
With latest updates on EV from
Industry Experts & Renowned Academicians.
Networking with Fellow colleagues and
witnessing the Live Testing Sessions - a rare opportunity*

With increased Vehicle Electrification & fortified impact of depleting fossil fuel resources, ascending carbon footprints, and escalating fuel prices, there is a paradigm shift in market scenario, in 2 - 3 Wheeler Vehicles. A sea change is observed in EV designs and technological improvements in the vehicle as well as its components, including the drive train.

The course is focused to address the pressing need for creating knowledgeable and skilled Engineers in all aspects of 2 - 3 wheeler EV Design, Testing and validation process. Through this course, we wish to support and facilitate electric vehicle performance enhancement in future, for faster implementation of Vehicle Electrification target, in line with Government objectives.

Objectives:

- Explore predominant Concepts of Two - Three Wheeler EV Technology for Strengthening the community of Electric Vehicles Designers & manufacturers.
- Update on Advances in technological developments in EV Drive Train, Motor, Controller, Battery, Battery Management system and various types of Battery Charging techniques.
- Familiarization with Electric Vehicles testing procedures, and its significance in terms of safety Standards, including Characterization of Motor, Battery etc.



Topics reckoned for Coverage:

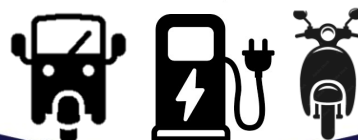
1. **Mechanical Structure Design:** Different types of structural Frames and Body. Functional requirement and design considerations, for the pattern of Stresses due to Loads/Forces acting on structural Members and CAE Analysis.
2. **Functional and Dynamic Performance** requirements of Two - Three Wheeler vehicles. Wheels and Tyres characteristics considerations for optimum performance.
3. **System Integration, Handling and Ride** behavior characteristics of Suspension & Steering.
4. **Drive Train components:** Types of Electric Motors and Controllers & it's performance criteria.
5. **Emerging Technology of Battery / Energy Storage** systems. Types of Automotive Batteries for EV, and Charging methodology.
6. **Parameters of Battery Management System - BMS**, for optimal performance.
7. **Product and System Testing:** Discussion on Standards applicable for Electric Vehicles and Power train components. Laboratory Testing and Demonstration.

Who should attend:

- Engineers from Automotive Industry, EV vehicles & EV Motor Manufacturers, EV System Integration Engineers involved in Design & Development and Testing of Electric 2 - 3 Wheeler Vehicles.
- Entrepreneurs and Engineers from EV Startups, EV Design & Architecture Providers, Battery Pack makers, Tyre Manufacturers, Electronics Companies, Sensors Companies.
- Engineers from automotive Industry, engaged in Vehicle Dynamics domain.
- Research Scholars, Post Graduate / PhD Candidates and Faculty members from Educational Institutes, working on Research areas in EV technology.

Dates: 8th - 9th Dec'2023 (Fri-Sat).

Participation Certificate will be awarded to all.
Only limited Seats available. Hurry up to Register.



ABOUT NATRAX

NATRAX is a State-of-the-Art Testing and Certification Centers, under National Automotive Board (NAB), under Ministry of Heavy Industry, Government of India. It is a one of a kind Proving Ground in India, catering to all the requirements of Automotive Industry. The Center was planned under the Automotive Mission Plan 2006-2016, launched by the Government of India, on approx. 3000 acres of land. NATRAX serves as a comprehensive test facility for the entire Automobile Industry, and provides a one stop solution for the development, Certification and R&D Projects, be it for National or Global automotive, auto components or tyre Industry. Under the Automotive Mission Plan, NATRAX is designated to be the Center of Excellence in Vehicle Dynamics. The center is also planning / conducting various training programs for Skill India mission in association with the Ministries and Academia.




NATRAX was notified under CMVR -126 as a Homologation and certification agency in June 2019. The special tracks, like High-Speed Track, Dynamic platform, Braking, Noise and Gradient tracks are being used for all Vehicle's type approval. All the mentioned tracks are certified by M/s TUV, Rhineland, as per ISO 17025:2017 norms. Keeping abreast with the requirements of the Development in the Industry, NATRAX is also establishing infrastructure and facilities for the development, testing and certification of the Electric Vehicles and Components.

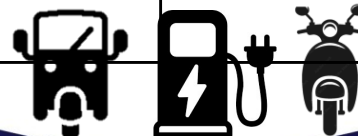
“NATRAX is also accredited under ISO 17025:2017 for Certification tests, including Crash Barrier certification (EN-1317).”

Located near the vibrant Industrial township of Pithampur, NATRAX is situated approx. 50 Km from Indore, the commercial capital of Madhya Pradesh, on NH-3 bypass road (Indore-Mumbai). This place is well connected by rail, road and air with Metros like New Delhi, Mumbai, Chennai, Pune, Bangalore, Hyderabad, Ahmadabad, Jaipur and Dubai.






Speaker's:

Speaker	Profile	Topics
<p>Mukunda Nijagal Ather Energy</p> 	<p>He is Lead, Chassis Design at Ather Energy. Graduated in Mechanical Engineering from MS Ramaiah University, Bangalore. He has 13 years of experience in the field of Design. Prior to Ather Energy, he worked at Bosch and Mahindra and Mahindra Ltd.</p>	<p>Mechanical Structure Design: Different types of structural Frames and Body. Functional requirements and Design considerations for the pattern of stresses due to loads / forces acting on structural members.</p>
<p>Ashish Mishra, Ather Energy</p> 	<p>He is Head-Vehicle Engineering and Simulation Dept. at Ather Energy. B.Tech. from National Institute of Technology, Bhopal in Mech. Engg., with 14+ years of experience in the field of Mechanical Design, Simulation and Testing. Earlier worked at Bajaj Auto R&D. He strongly believes in simulation driven product designs and & integration, for faster & efficient new product developments.</p>	<p>CAE Analysis of Mechanical Structure of Different types of structural Frames and Body. Design considerations for the pattern of stresses due to loads / forces acting on structural members.</p>
<p>Lokesh Soni, Simple Energy</p> 	<p>He holds MTech in Control Systems from IIT Kharagpur. Through 11 years career in R&D, in EV and Advanced Driver Assistance Systems domain, he gained expertise in Vehicle Dynamics and performance algorithms to Autonomous vehicle path planning and control systems. He contributed to Mahindra Research Valley, Mercedes Benz R&D, Ather Energy, ZF and currently at Simple Energy he leads Vehicle Dynamics and performance Dept. He has to his credit 13 Patents, Highest level (L3) riding school certification, 11 SAE and IEEE publications. He is Reviewer for SAE International & IEEE Journals.</p>	<p>“Vehicle Character Development”: System Integration, Handling and Ride behaviour characteristics of Suspension & Steering. “Vehicle Dynamics- Development and Tuning: Functional & Dynamic performance requirements of Two-Three Wheeler EV.</p>
<p>Dr. Devendra Deshmukh, Department of Mechanical</p> 	<p>Master's and Ph.D. from Indian Institute of Science Bangalore, India. His research included investigations on SVO sprays for CI engines, liquid fraction distribution in dense sprays using planar laser techniques, modelling of multi component evaporating spray, renewable fuels for CI engine and characterizing dense sprays. Current interests include multi species detection and emissions in biofuel combustion using laser diagnostics and exhaust emission reduction, waste heat recovery, and Hybrid electric vehicle.</p>	<p>Electric Vehicle Performance.</p>
<p>Prof. Dr. S.K.Sharma, Electrical Engineering SGSITS, Indore</p> 	<p>Post Doc research Fellow at ETS University, Montreal, Canada. PhD from IIT Delhi. M.Tech in Power Electronics & BE in Electrical. Published more than 44 Research papers in reputed international journals. His main research interests are in control of renewable energy sources, Green Hydrogen production, Electric Vehicles, Smart Loads and Solid-State Transformers. A Senior member of IEEE, Fellow IE, & IRSS.</p>	<p>Drive Train components: Types of Electric Motors and Controllers.</p>



Speaker	Profile	Topics
<p>Dr. Sunil Kumar, Associate Professor Dept. of Metallurgical Engg. and Materials Science, IIT, Indore.</p> 	<p>He worked as a Research Fellow at the National University of Singapore in Li-air batteries and as an Erasmus-Mundus Fellow at Barcelona Tech. He did his PhD at the Indian Institute of Science (IISc) Bengaluru.</p> <p>He has authored over 90 research articles in various peer-reviewed journals and conferences.</p> <p>His research focuses on cathode and electrolyte materials for Li-ion, Na-ion, and All-Solid-State batteries.</p>	<p>Types of Automotive Battery Electrolyte Chemistry for EV. Life cycle of Battery under different discharging / Charging Methodology. Parameters of Battery Management System for optimum performance.</p>
<p>Debi Prasad Dash, Executive Director - India Energy Storage Alliance (IESA) Customized Energy Solutions</p> 	<p>He is MBA in Finance from Symbiosis International University and PG Diploma in Renewable Energy from TERI University, with over a decade of industry experience. He was awarded with POSCO ASIA Fellowship by POSCO TJ Park Foundation. He is involved in techno-commercial feasibility, strategy formulation policy recommendations and consulting for energy storage & advanced battery technologies, green hydrogen, smart/micro grid for EV infrastructure, development & manufacturing of EV, green hydrogen road map for India. He is part of BIS Energy Storage Standards Committee (ETD-52),</p>	<p>Emerging Technology of Battery / Energy Storage systems. Types of Automotive Batteries for EV and Charging methodology / Charger Types.</p>
<p>Dr. Lenin, COO - Aracion Technologies LLC (UK, USA) VP- AA Electro Magnetic Test Laboratory Pvt Ltd, Gurgaon Director – EMC Test & Training Center</p> 	<p>Ph.D [RF & Antenna], Master of Engineering [VLSI Design], BE [ECE], Diploma [EEE] Anna University Chennai, Tamil Nadu, India.</p> <p>Member BIS Standard Committee for Electromagnetic Compatibility and . He is National Working Group member, serving as IEEE Senior Member - EMC Society & Product safety engineering. His research areas include EMI-EMC & RF Design Issues in EV Chargers / Connected vehicles. He is Professional consultant, trainer with 15 +Years of Experience in the Field of EMC, RF, Telecom, Environmental, Interface & Medical safety Product (Testing of 10,000 + Products).</p> <p>He is an Editorial Board member of 15 International Journals. Published 48 Research Articles, in National & International Journals.</p>	<p>“Pitfalls and mitigation techniques in EMC design for Automotive products”. Parameters of Battery Management System - BMS, for optimum performance.</p>



Speaker	Profile	Topics
<p>Saurabh Gupta, Senior Manager, CEAT</p> 	<p>With a career spanning 16 years, he has held pivotal roles of Tyre Product development & Tyre to Vehicle Integration. Having contributed to CEAT, Goodyear, Ford, currently he engages with 2W OEM's to drive innovation and development of cutting-edge products for motorcycles, scooters and three wheeled vehicles.</p>	<p>Overview about 2W tyres design process & challenges in tyre tuning to Vehicles. 2W Vehicle Dynamics. Overview of subjective testing and subjective to Objective correlation. 2W EV testing, and demo on test track on an instrumented vehicle + Data acquisition.</p>
<p>Kaustubh Kirtane, Manager Veh. Dynamics, CEAT</p> 	<p>He has 12 years of experience at Apollo Tyres & CEAT, in Subjective and Objective Vehicle Dynamics testing at Domestic and International test tracks and objective data acquisition & analysis. He is also, working on 2W objective veh. Dynamics testing development with CEAT.</p>	<p>Overview about 2W tyres design process & challenges in tyre tuning to Vehicles. 2W Vehicle Dynamics. Overview of subjective testing and subjective to Objective correlation. 2W EV testing, and demo on test track on an instrumented vehicle + Data acquisition.</p>
<p>Mr. Umesh Raghuwanshi, Asst. Manager- Vehicle Dynamics and EV Lab</p> 	<p>He is having 15 Years of rich experience in Automotive testing, Homologation / Certification and R&D / Product Development. He is Currently Heading operations in Testing of Vehicle Dynamics Lab and Vehicle Certification for Electrical Vehicles at NATRAX.</p>	<p>Product and System Testing: Discussion on Standards applicable for Electric Vehicles and Power train components. Laboratory Testing and Demonstration.</p>



Schedule of Workshop:

DAY 1 : 8th Dec' 2023

Speaker	Topics / Activity	Scheduled time
Inauguration		9.00 to 9.30 hrs
Mukunda Nijagal & Asish Mishra, Ather Energy	Mechanical Structure Design: Different types of structural Frames and Body. Functional requirements and Design considerations for the pattern of stresses due to loads / forces acting on structural members and CAE Analysis.	9.30 to 11.30 hrs
Lokesh Soni, Simple Energy	Functional and Dynamic Performance requirements of Two - Three Wheeler vehicles. System Integration, Handling and Ride behavior characteristics of Suspension & Steering.	11.30 to 13.30 hrs
Lunch Break		13.30 to 14.00 hrs
Dr. Devendra Deshmukh, IIT, Indore	Electric Vehicle Performance.	14.00 to 15.30 hrs
Tea Break		15.30 to 15.45 hrs
Prof. Dr. S.K.Sharma, Electrical Engineering. SGSITS, Indore	Drive Train components: Types of Electric Motors and Controllers.	15.45 to 17.30 hrs



Schedule of Workshop:

DAY 2 : 9th Dec' 2023

Speaker	Topics / Activity	Scheduled time
Dr. Sunil Kumar, IIT, Indore.	Types of Automotive Battery Electrolyte Chemistry for EV. Life cycle of Battery under different discharging / Charging Methodology. Parameters related to Battery chemistry for optimum performance of Battery Management System.	9.30 to 10.30 hrs
Debi Prasad Dash, ED (IESA)	Emerging Technology of Battery / Energy Storage systems. Types of Automotive Batteries for EV and Charging methodology / Charger Types.	10.30 to 12.00 hrs
Dr. Lenin	Pitfalls and mitigation techniques in EMC design for Automotive products. Parameters of Battery Management System - BMS for optimum performance.	12.00 to 13.30 hrs
Lunch Break		13.30 to 14.00 hrs
Subhash Gupta & Kaustubh Kirtane CEAT	2W Vehicle Dynamics. Overview about 2W tyres design process & challenges in tyre tuning to Vehicles. Overview of subjective testing and subjective to Objective correlation. 2W EV testing, and demo on test track on an instrumented vehicle + Data acquisition.	14.00 to 15.45 hrs
Tea Break		15.45 to 16.00 hrs
Umesh Raghuwanshi, NATRAX	Product and System Testing: Discussion on Standards for Electric Vehicles and Power train components. Laboratory Testing Demonstration.	16.00 to 17.45 hrs



Coordinator: Dr. Sudhir Gupte, Principal Associate - Learning and Development, NATRAX.

Special Thanks to: Mr. Umesh Raghuwanshi, National Automotive Test Tracks
&
Dr. Ashok Atulakar, Shri G.S. Institute of Technology and Science

Registration Link:

<https://forms.gle/fuXNxxk6jY9up3Ac58>
Click here to register

Fees : For Industry Professionals: Rs. 8000/- + Tax @ 18%

For Engineering Students: Rs.5000/- + Tax @ 18%

Fees to be deposited in favor of NATRAX. Reference no. of Bank transaction to be added, while filling the form.

Account no. 153201001488

IFSC Code. ICIC0001532

BANK: ICICI BANK, Pithampur

OR

Use QR Code:

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If required, Contact Mr. Sushil kumar (+91 9718194445) for Assistance in Registration.



राष्ट्रीय मोटर वाहन परीक्षण ट्रैक / National Automotive Test Tracks (NATRAX)
राष्ट्रीय ऑटोमोटिव बोर्ड के अंतर्गत / Under National Automotive Board (NAB),
भारी उद्योग मंत्रालय, भारत सरकार / Ministry of Heavy Industries, Government of India

आगरा - मुंबई हाइवे (एन. एच. 52) / Agra - Mumbai Highway (NH -52),

पिथमपुर फ्लाईओवर के आगे, पोस्ट - खंडवा (पिथमपुर के पास) / Next to Pithampur Flyover, Post Khandwa (near Pithampur)

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