

Title of the Tutorial – EV Design Fundamentals and Standards.

Abstract: Pure electric, hybrid electric, and fuel cell-powered drivetrain technologies are the most promising solutions to the problem of land transportation in the future. To be able to design the future EVs and its variants, the knowledge of the fundamentals, theory, and design of conventional internal combustion engines (ICEs), electric vehicles (EVs), hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs) is essential. It is also required to know the vehicle performance, configuration, control strategy, design methodology, and modeling for different conventional and modern vehicles based on mathematical equations.

The objective of this tutorial is to provide the basic knowledge that is necessary for understanding of the vehicular drive train design. Discussion would include vehicle system analysis, ICE-based drive trains, EV design, HEV configurations, electric propulsion systems, series/parallel/mild hybrid electric drive train design methodologies, energy storage systems, regenerative braking, fuel cells and their applications in vehicles, and fuel cell hybrid electric drive train design. A discussion on the design methodology will be described by step-by-step mathematical equations along with design examples covering the design of EVs (2-, 3-, and 4-Wheelers). Design standards of EVs being followed throughout the world will be discussed with their merits under different driving conditions. Practical data from EVs in action will be presented and compared suggesting the possible modifications for better performance.



About the Speaker:

Dr. P. R. Sahu, PhD from IIT Kanpur, India in the year 2006 has worked as faculty member in IIT Guwahati, India since 2005 before joining IIT Bhubaneswar in July, 2013. He is originally from the research area of wireless communications and is currently finding interest in the area of EVs. His specific interest lies in the EV body design for efficient utilization of resources. Study and examination of different standards of EVs is another area of his interest which he is exploring at present.