

Electric Vehicle and Hybrid Electric Vehicle fundamentals

Course details:

- Course code: EV01
- Location: Online delivery
- Duration: 15 hours

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About the course:

Electric vehicles and Hybrid vehicles are becoming more popular and its entry in the automotive market all over the world is increasing drastically due to its less or zero emissions on road and at the same time providing more efficiency.

This course provides the fundamental knowledge of Common configurations, multiple architecture and working modes of Electric vehicles and Hybrid electric vehicles and the different terminologies associated with it. This course also provides the fundamentals of Electric motor technologies, Battery technologies and various other components needed in Electric and Hybrid electric vehicle.

Finally, you will have a chance to learn on the methodology of selection of EV and HEV component and also specify the list of the components needed to make EV or HEV vehicle.

Topical Outline:

EV and HEV fundamentals			
S.No	Lesson	Topic	Duration (hours)
1	Electrification	Introduction	1
		EV and HEV Common configurations	
2	Electrified powertrain configurations, types and Architectures	Series and Parallel configuration	1.5
		1. Types - BEV, HEV, PHEV	
		2. Vehicle working modes	
		P0, P1, P2, P3, P4 architecture	
3	Electric motors technology overview	Types of Motors and their applications	2
		Electric Motors Examples (AVID, MAGELEC, BorgWarner (Remy), Parker, Yasa)	
4	Batteries technology overview	Types of Batteries and their applications	2
		Battery Management Systems	

		Integrated and Distributed BMS Systems	
		Battery Cell modules and Thermal management	
		Battery Examples	
5	Other EV Hardware	Onboard Chargers	1.5
		DC-AC Inverters	
		Onboard Charger / DC-DC Converters	
		Heating and Cooling	
		High Voltage Air Conditioning	
		High Voltage PTC Heating Unit	
		Isometers	
		Cooling Pumps, Oil pumps, Water pumps	
		Display Units for Electric Vehicles	
		Other Hardware (foot pedals, Power distribution, etc)	
6	EV and HEV performance specifications	Vehicle Performance Specifications	3
7	Hands on EV design	How to Select Components	4

Learning Objectives:

By attending this course, you will be able to:

- Understand IC Engine powertrain and Electric motor powertrains
- Understand the different components of Electric powertrains
- Understand the challenges of Electric and Hybrid Electric vehicles
- Create requirements needed for EV and HEV configurations
- Design EV and HEV vehicle with the right components

Who Should Attend:

- Candidates who would like to learn about Electrical vehicles
- Candidates working on IC Engine development and like to transit to Electric vehicle development
- Candidates who are willing to pursue career in Electric vehicles

Pre-requisites:

None