Seminario - eMob 200

ePower train fundamental

Corso presso: **Festo Academy**
Via Enrico Fermi, 36/38, 20057 - Assago (MI)

Durata: **2gg**

Date: Per la prossima edizione in programma contattateci.

Scarica modulo iscrizione:
www.festocte.it/iscrizione

The requirement for ever-lower emissions is accelerating the automotive industry's electrification strategies. The product line-up on offer now ranges from HEVs (ICE combined with an electric powertrain) to so-called plug-in PHEVs (rechargeable hybrids) to purely electrically powered vehicles (BEVs). It is not just the number of variants that is increasing, but also the control and communication complexity of the powertrain. These are primarily the interaction between driver acceleration, braking, battery modules, electric motors, power electronics and transmissions. Information and communication technology will be smaller and smaller and how does this translate into our electric mobility? Single throttle driving is a first step towards more intuitive driving, however what happens if somebody gets stressed and presses the pedal to the floor! Sensors are required to reduce the speed of vehicles in case this happens. Further a crumple zone is still present since we do not trust technology. Trust and feeling are difficult to capture, hence our vehicles are still heavy and loaded with safety systems. The battery also needs intelligence and thermal protection, hence the computational power in a vehicles has risen exponentially. How to deal with this and the dependency on 'microchips', integrated circuits.
Supply chain and recycling will be key in the future!
This webinar introduces to the fundamental in understanding electrical motors and drive performance

Target

- Engineering process expert
- R&D professional
- Powertrain engineers
- Electric drive enthusiasts
- Quality Professional

Training Outcomes

- Understand of fundamental elements of electrical motors and drive performance
- Analyze and understand motors drives and magnetic phenomena
- Be able to evaluate alternative solutions in supplying electrical motor and drives to vehicle systems

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Come raggiungerci

Contents

Electromechanical energy

- Basic principles of the electromechanical energy conversion.
- Torque-speed characteristics.
- Evaluate motors and drives performances, i.e. for automotive and motion control.
- Calculate simple electric circuits using complex calculus and phasors, which simplify electric circuit analysis.
- Calculate three-phase circuits with wye and delta connection of a load.
- Analyze a plant (motor) and built its model in ABC-DQ.
- Represent main electromagnetic quantities (as voltage, current, mmf, and etc.) of an AC machine as a space vector which simplify analysis of machines.

Motors & drives

- Analyze a plant (motor) and built its model in order to design an optimal control.
- Understand structure, operating principle and build equivalent circuit of synchronous machines using space vector representation.
- Be able to analyze an electrical drive system of synchronous machines (including permanent magnet machines).
- Understand, design and synthesize magnetic circuits taking into account magnetic losses and leakages, of different permanent magnet machines.
- Field oriented control of permanent magnet synchronous machines using space phasors and synchronous reference frame theory.
  - Structure of the electrical drive.
  - Dynamical model.
  - Operating regions.
  - Current control.
  - Feed-forward and decoupling.
  - Flux-weakening.
  - Applications.

Energy efficiency

- Take into account energy losses during electromechanical energy conversion Build/understand efficiency maps of electromagnetic devices.

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Labs

An operative case to challenge the participants during the lecture.

Prerequisite and suggested seminar

- eMob 100 -

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