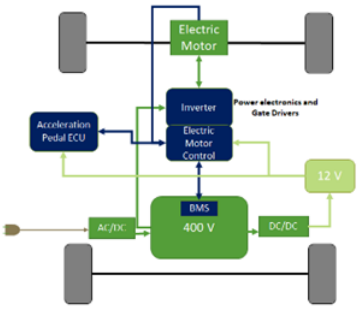
EuroSPI / ASA Certified Electric Powertrain Engineer

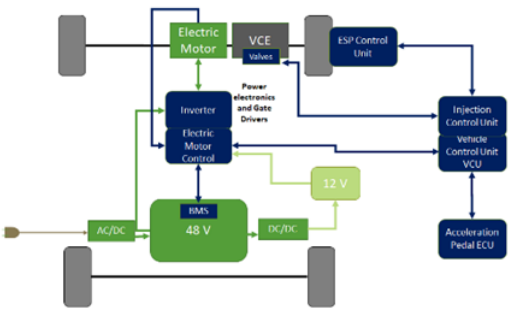
Goal

In this 5 days training course the attendees get introduced to the different architectural concepts of electric powertrains. The participants will participate actively be involved in case studies and elaborate on the concepts of an electric powertrain architecture.

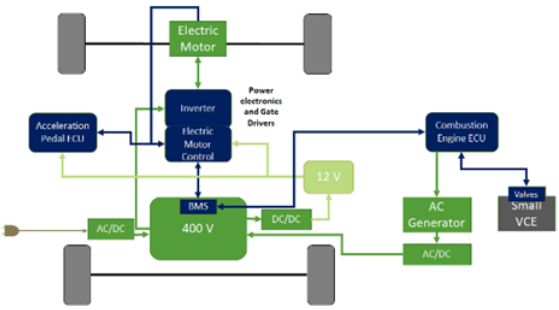
BEV



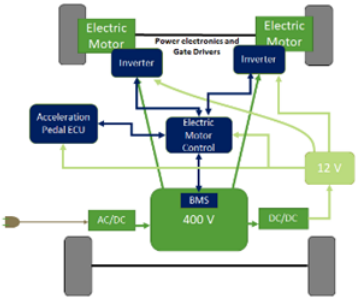
HEV



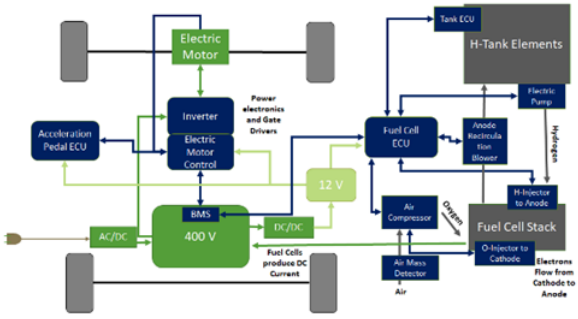
REV



IWEV



FCEV



in cooperation with ISCN

The approach of „Learning by Doing“ is used to elaborate different forms of electric powertrains, analyze advantages and disadvantages, do a safety analysis and elaborate questions concerned with motor control.

The training modules are based on the skills set structure promoted by the ASA (Automotive Skills Alliance, as a result of the EU Blueprint project for automotive DRIVES, 2018 - 2022). And the development was co-funded by the project CYBERENG (2021-2022) in the Erasmus+ Programme of the European Union under the agreement 2019-1-CZ01-KA203-061430.

From the technical perspective, there are several electric powertrain concepts being used and developed nowadays (see Fig. above) and the training covers those concepts:

- Battery Electric Vehicle (BEV),
- Hybrid Electric Vehicle (HEV),
- Range Extender Electric Vehicle (REV),
- Fuel Cell Electric Vehicle (FCEV),
- In Wheel Concept of an Electric Vehicle (IWEV)

Content

The training modules are based on the skills set structure.

- Training Module U.1 Introduction
  - Lecture U1.E1 ePowertrain Engineer
  - Lecture U1.E2 Product life cycle
  - Lecture U1.E3 Product homologation and standards
  - Lecture U1.E4 Embeded automotive systems
  - Lecture U1.E5 ePowertrain Architecture
- Training module U.2 System engineering (Function-based-Development)
  - Lecture U2.E1 Function-Based Development
  - Lecture U2.E2 Functional Safety Aspects + Exercise
  - Lecture U2.E3 Cyber Security aspects + Exercise
- Training module U.3 Propulsion systems
  - Lecture U3.E1 eMotor
  - Lecture U3.E2 Power electronics, inverters
  - Lecture U3.E3 Motor control unit + Interactive Session for Exercise
  - Lecture U3.E4 Hybrid control systems
  - Lecture U3.E5 Energy transformation systems + Exercise
  - Lecture U3.E6 Transmission systems + Exercise

- Training module U.4 Energy Storage Systems

- o Lecture U4.E1 Battery systems + Exercise
- o Lecture U4.E2 Battery management systems + Exercise
- o Lecture U4.E3 Fuel cells + Exercise

- Training module U.5 Life Cycle Management
  - o Lecture U5.E1 Product life cycle
  - o Lecture U5.E2 Life Cycle Management and Business Models + Interactive Discussion

Schedule

Day 1

Time	CA / Chapter
8.00 - 12.00	U.1 Inroduction
13.00 - 17.00	U.2 System engineering

Day 2

Time	CA / Chapter
8.00 - 12.00	U.2 System engineering
13.00 - 17.00	U.3 Propulsion systems

Day 3

Time	CA / Chapter
8.00 - 12.00	U.3 Propulsion systems
13.00 - 17.00	U.3 Propulsion systems

Day 4

Time	CA / Chapter
8.00 - 12.00	U.4 Energy storage systems
13.00 - 17.00	U.4 Energy storage systems

Day 1

Time	CA / Chapter
8.00 - 12.00	U.4 Energy storage systems
13.00 - 17.00	U.5 Life Cycle Management

Training Materials

The training materials include slides, links to best practices, and templates for exercises. etc.
It also includes training videos and interactive sessions to understand how to program a motor control.
Additionally the training is supported by an online teaching environment set up on the online EuroSPI academy platform. https://academy.eurospi.net.

Target Group and Prerequisites

Engineers and managers who want to learn a systems engineering approach for electric powertrain engineering. It is a combination of system, software and hardware design aspects that need to be integrated and where interfaces and dependencies need to be controlled.
Powertrain engineers require a background in software/hardware/electronics engineering. Also a basic understanding of modelling techniques is helpful. Usually attendees require some minimum 5 years work experience in automotive software or hardware to easily manage the course exercises.

Cancellation

Cancellation is not possible. You may determine a substitute or attend the course at a later date.

Examination and Certification

Exams are organised by the EuroSPI / ASA certification organisation. In case of electric powertrain engineers the exam is based on a set of mandatory exercises to be performed in the course under the observation of the trainers.
The EuroSPI / ASA system allows to register with a job role, upload the exercises and have an assessor in the system assessing the student performance in the practical exercises. The EuroSPI / ASA system generates a unique certification ID and certificate for the attendee.
Every 2 years the certificate will later need to be renewed by attending a short update training of 1 day to learn about the new state of the art developments in functional safety.

https://conference.eurospi.net/index.php/certification

The EuroSPI Academy

The training is held in the EuroSPI academy in cooperation with ISCN. The company ISCN is a certified training partner of VDA-QMC and Intacs® for Automotive SPICE (https://nqa2.iscn.com/images/PdfFiles/TP-Certificate-CCF15042021.pdf, http://www.intacs.info/index.php/component/weblinks/category/122-training-organisation).
The EuroSPI Academy (https://academy.eurospi.net) was founded in 2021 in cooperation with the ASA (Automotive Skills Alliance) and offers an advanced online training environment with materials, templates and exercises. EuroSPI and ISCN are full partners of the ASA (https://automotive-skills-alliance.eu/#partners).
In cooperation with ASA WG 3.6 (IT in Automotive) and the EU project FLAMENCO this training platform will be further developed in the next years.

Join our community of knowledge.