



ECQA Certified Powertrain Engineer

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How to Guide – Attending a Course in the Online Academy

Online Academy

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Contents



- Access to the Course Area
- Content and Structure
- Attending Exams and Self Assessment of Skills (separate How-to Guides)
- Exercises and Interactions

Access to the Course Area

ECEPE Online Training in EuroSPI Academy

Course Area



1. Go to the website

- <https://academy.eurospi.net>



Login/Register

BUILDING A COMMUNITY OF KNOWLEDGE

Home

Our Courses

All Research and Engineering Qualitymanagement

 Updated 6/12/21 Electric Powertrain Engineer 109 5	 Updated 16/02/22 Cybersecurity Engineer 64 5	 Updated 6/12/21 Functional Safety Manager 117 5	 Updated 6/12/21 Functional Safety Engineer 161 5
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Select Course



- <https://academy.eurospi.net>

BUILDING A COMMUNITY OF KNOWLEDGE

Home

2. Select Course

Our Courses

All Research and Engineering Qualitymanagement

 Updated 6/12/21 Electric Powertrain Engineer 109 5	 Updated 16/02/22 Cybersecurity Engineer 64 5	 Updated 6/12/21 Functional Safety Manager 117 5	 Updated 6/12/21 Functional Safety Engineer 161 5
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Register or Login (if you have already an account)



Login to your account

Username

Password

Remember username [Forgot Password?](#)

Log in

Cookies must be enabled in your browser [?](#)

Some courses may allow guest access

Log in as a guest

Or

Is this your first time here?

For full access to this site, you first need to create an account.

Create new account

3.a Login, or

3.b Create an account

Register or Login (if you have already an account)



New account

Have an account? [Login](#)

Choose your username and password ▼ Collapse all

Username

The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 non-alphanumeric character(s) such as as *, -, or #

Password

More details

Email address

Email (again)

First name

3.b.1 Enter details

3.b.2 After creation an email is sent to you, and after clicking the confirm link the account will be activated

Enrollment Key



- Once the account is confirmed and you login the system will ask you for an enrolment key
- **Only with an enrolment key** (provided by the training body) the access is granted by the system.
- The system asks you only once, after that it remembers your access is granted.

Content and Structure

ECEPE Online Training in EuroSPI Academy

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ELECTRIC POWERTRAIN ENGINEER

Home / My Courses / ECEPE

Course Content

Course start date: 27/09/21 Category: Research and Engineering

Your progress

General

Course Overview

Unit 1 - Introduction

Unit 2 - System Engineering (Function-based development)

Unit 3 - Propulsion Systems

Unit 4 - Energy Storage Systems

Unit 5 - Life Cycle Management

4. You can open different chapters

Options

Version 1



Co-funded by the
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of the European Union

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Your progress

- General
- Course Overview
- Unit 1 - Introduction
- Unit 2 - System Engineering (Function-based development)
- Unit 3 - Propulsion Systems
- Unit 4 - Energy Storage Systems
- Unit 5 - Life Cycle Management
- Exam
- Further reading
- Acknowledgements

4. You can open different chapters (continued)

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General



Welcome to the e-Powertrain Engineer Course!

This work is supported by the ECEPE project. The ECQA Certified Electric Powertrain Engineer project (ECEPE) is co-funded by the Erasmus+ Call 2019 Round 1 KA203 Programme of the European Union under the agreement 2019-1-CZ01-KA203-061430.



5. In the intro you can read the skills set or do skills browsing

Announcements

ECEPE Skills Analysis - EuroSPI 2020 - SPRINGER CCIS 1251 Book

ECEPE Skills Set and Background - EuroSPI 2021 SPRINGER CCIS 1442 book

Skill Browsing

Options

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Course Overview

Based on skills definition norms we have established the structure of the electric powertrain (ePowertrain) skill card which is grouped into units.

	Date	Time	#Slides	Exercise	Presentation in mins	Exercise in mins	Who	Hours without coffee breaks
Training Module U.1 Introduction (available 4 hours.)								
Lecture U1.E1 ePowertrain Engineer	19.11.2021	08.00 - 08.30	15	no	30		TUG	
Lecture U1.E2 Product life cycle	19.11.2021	08.30 - 09.00	8	no	30		HSD	
Lecture U1.E3 Product homologation and standards	19.11.2021	09.00 - 10.00	39	no	60		TUS	
Lecture U1.E4 Embedded automotive systems	19.11.2021	10.30 - 11.30	26	no	60		TUG	
Lecture U1.E5 ePowertrain Architecture	19.11.2021	12.30 - 13.00	12	no	30		ISCN	3,5
Training module U.2 System engineering (Function-based-Development) (available 8 hours)								
Lecture U2.E1 Function-Based Development	19.11.2021	13.00 - 14.00	24	no	60		ISCN	
Lecture U2.E2 Functional Safety Aspects + Exercise	19.11.2021	14.00 - 17.00 (incl. Break)	40	yes	90		90 ISCN	
Lecture U2.E3 Cyber Security aspects + Exercise	09.12.2021	08.00 - 09.30	26	yes	60		90 TUG	6,5
Training module U.3 Propulsion systems (available 12 hours)								
Lecture U3.E1 eMotor	25.11.2021	08.00 - 10.00	51	no	90		VSB/TUO	
Lecture U3.E2 Power electronics, inverters	25.11.2021	10.30 - 12.00	35	no	60		VSB/TUO	
Lecture U3.E3 Motor control unit + Interactive Session for Exercise	25.11.2021	13.00 - 16.30 (incl. Breaks)	38 + Video	yes	90		90 ISCN/TUG	
Lecture U3.E4 Hybrid control systems	02.12.2021	08.00 - 09.00	39	no	60		VSB/TUO	
Lecture U3.E5 Energy transformation systems + Exercise	02.12.2021	09.00 - 10.00	28	no	60		TUS	
Lecture U3.E6 Transmission systems + Exercise	02.12.2021	10.30 - 12.30	42	yes	90		90 TUS	10,5
Training module U.4 Energy Storage Systems (available 12 hours)								
Lecture U4.E1 Battery systems	09.12.2021	10.00 - 11.00	16	no	60		VSB/TUO	
Lecture U4.E2 Battery management systems + Exercise	09.12.2021	and 13.00 - 14.00	26	no	60		60 TUG	
Lecture U4.E3 Fuel cells + Exercise	09.12.2021	14.00 - 15.00	28	no	60		90 TUS	5,5
Training module U.5 Life Cycle Management (available 4 hours)								
Lecture U5.E1 Product life cycle	16.12.2021	08.00 - 09.00	8	no	30		HSD	
Lecture U5.E2 Life Cycle Management and Business Models + Interactive Discussion	16.12.2021	09.00 - 12.00 (incl. Breaks)	45	yes	60		60 HSD	2,5

6. Course overview shows the defined course structure

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Unit 1 - Introduction

The unit introduces the e-powertrain domain. It investigates the main challenges and drivers-of-change in the automotive sector and the rationale behind electric powertrains. Different solutions such as the full electric vehicle, plug-in hybrid and hybrid are being described. The unit introduces also the product lifecycle phases from raw materials, via the development processes of embedded automotive systems (including the V-Cycle), production to the disposal.

U1.E1 Introduction - Motivation and Challenges SLIDES

U1.E1 Introduction - Motivation and Challenges | Student Handout

U1.E2 Introduction Product Life Cycle - SLIDES

U1.E2 Introduction Product Life Cycle | Student Handout

U1.E3 Introduction - Product Homologation and Standards SLIDES

U1.E3 Introduction - Product Homologation and Standards | Student Handout

U1.E4 Introduction - Embedded Automotive Systems SLIDES

U1.E4 Introduction - Embedded Automotive Systems | Student Handout

U1.E5 Introduction - ePowertrain Architecture SLIDES

U1.E5 Introduction - ePowertrain Architecture | Student Handout

7. Introduction related unit U1 with elements and training material per element

Options

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Unit 2 - System Engineering (Function-based development) ▾

The unit introduces system architecture thinking in context of an e-powertrain with an understanding of system functional design, system-wide feature thinking for functional safety, and cyber-security related development. It highlights the main components of an e-powertrain, the approaches and rationales behind dependable (safety & security) engineering concepts for electric powertrains. Different concepts, such as signal flow concepts, effect chain between components, and risk management in complex system design are being described.

U2.E1 System Engineering - Function Based Development SLIDES

U2.E1 System Engineering - Function Based Development | Student Handout

U2.E2 System Engineering - Functional Safety Aspects SLIDES

U2.E2 System Engineering - Functional Safety Aspects | Student Handout

U2.E3 System Engineering - Cybersecurity Aspects SLIDES

U2.E3 System Engineering - Cybersecurity Aspects | Student Handout

Unit 3 - Propulsion Systems ▾

Unit 4 - Energy Storage Systems ▾

Unit 5 - Life Cycle Management ▾

Exam ▾

8. Introduction related unit U2 with elements and training material per element

Options

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Unit 3 - Propulsion Systems

This unit gives an overview about the division of electric motors, their principles, behaviour and control methods as well as overview about the division of car/vehicle inverters and Power electronics (PE) components. The motor control to manage the phase currents of the electric motor is done by a special Software called Field Oriented Controller (FOC) Software. Defined Software tool setups are used to explain the motor control software. An overview on block structures, properties, control methods and strategies of hybrid control systems is presented.

 U3.E1 Propulsion Systems - E-Motor SLIDES

 U3.E1 Propulsion Systems - E-Motor | Student Handout

 U3.E2 Propulsion Systems - Power Electronics - Inverters SLIDES

 U3.E2 Propulsion Systems - Inverters | Student Handout

 U3.E3 Propulsion Systems - Motor Control Unit SLIDES

9. Introduction related unit U3 with elements and training material per element

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Unit U3 System Engineering

10. Multimedia teaching video developed by team for e-motor control

- U3.E3 Propulsion Systems - Motor Control Unit | Student Handout
- U3.E4 Propulsion Systems - Hybrid Control Systems SLIDES
- U3.E4 Propulsion Systems - Hybrid Control Systems | Student Handout
- U3.E5 Propulsion System - Energy Transformation Systems SLIDES
- U3.E5 Propulsion System - Energy Transformation Systems | Student Handout
- U3 E6 Propulsion Systems - Transmission Systems SLIDES

9. Introduction related unit U3 with elements and training material per element



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Unit 4 - Energy Storage Systems

The unit 4 "Energy Storage Systems" gives an overview of battery systems, battery management systems and fuel cells systems. Differences between the traction battery in a car with electric drive (EV) and traction battery for hybrid vehicle (EHV) as well as the differences in the properties of both on-board power supply networks are being discussed. Issues, solutions of systems, circuit solutions for measuring and evaluating the isolation condition, BMS hardware and software components and fuels cell systems principles are the main topics covered.

U4.E1 Energy Storage Systems - Battery Systems SLIDES

U4.E1 Energy Storage Systems - Battery Systems | Student Handout

U4.E2 Energy Storage Systems - Battery Management Systems SLIDES

U4.E2 Energy Storage Systems - Battery Management Systems | Student Handout

U4.E3 Energy Storage Systems - Fuel Cells SLIDES

U4.E3 Energy Storage Systems - Fuel Cells | Student Handout

Unit 5 - Life Cycle Management

Exam

Further reading

Acknowledgements

11. Introduction related unit U4 with elements and training material per element



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Unit 5 - Life Cycle Management

The unit 5 "Life Cycle Management" gives an overview about Life Cycle related topics like the Product Life Cycle or Life Cycle Management. Students gain insight into different topics as the different phases of Life Cycle Management and how to apply them on practical topics. Furthermore business models are also involved in the taught subjects.

U5.E1/E2 Life Cycle Management - Product Life Cycle SLIDES

U5.E1/E2 Life Cycle Management - Product Life Cycle | Student Handout

12. Introduction related unit U5 with elements and training material per element

Exam

Exams are performed with the EuroSPI Certificates exam system from ISCN and certification partners are ECQA and ASA (Automotive Skills Alliance). In any case you must register for the ECEPE Electric Powertrain Engineer, see the link below. Once the test was passed we will interface for the skills badges with ASA. The interface to ASA will operate by the end of 2021.

Exam Portal Registration

Exam Portal Login

Exam System - How to Guide for Exam Participants in Case of Multiple Choice Based Exams

Exam System - How to Guide for Self Assessment and Exam Preparation

13. Link to exam software and additional exam related guides

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Further reading

- A study about electric powertrain engineering - Its Requirements and Stakeholders Perspective
in EuroSPI 2020 SPRINGER CCIS 1251 Book
- Adaptive Predictive Energy Management Strategy - Example for Electric Vehicle Long Distance Trip
in EuroSPI 2020 SPRINGER CCIS 1251 Book
- Normative Documents for Electric Vehicles and Possibilities for their Application in the Education of E-Powertrain Engineers
in EuroSPI 2021 SPRINGER CCIS 1442 Book
- Electric Powertrain Engineer Skills Needs and Pilot Course Implementation
in EuroSPI 2021 SPRINGER CCIS 1442 Book
- Bachelor Thesis in Project (German) - Schulungsaufbau Elektromotor-Antriebsstrang
Work for ECEPE by ISCN and TU Graz

14. ECEPE articles

Acknowledgements

Development Partnership (Technical University of Ostrava is the Project Lead)



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Options



Training Interaction



ELECTRIC POWERTRAIN ENGINEER

Home / My Courses / ECEPE / General / Discussing ...

Discussing Exercises

Here we upload and discuss joint exercises

Add a new discussion topic

Discussion	Started by	Last post ↓	Replies	Subscribe
★ U4.E2 Battery Management Systems - Problems, SOC, SOH, SOF	Michael Krisper 9 Dec 2021	Hossam Mossa 9 Dec 2021	29	<input type="checkbox"/>
★ U2.E3 Cyber Security Addendum: Standards and further References	Michael Krisper 9 Dec 2021	Michael Krisper 9 Dec 2021	0	<input type="checkbox"/>
★ U2.E3 Cyber Security: Motivation, Attacks, Impact	Michael Krisper 9 Dec 2021	Michael Krisper 9 Dec 2021	2	<input type="checkbox"/>
★ U1.E4: Exercise Consumer Hardware vs. Automotive Hardware: Safety, Security, Real-Time	Michael Krisper 19 Nov 2021	Michael Krisper 19 Nov 2021	3	<input type="checkbox"/>
★ Discussing Life Cycle	Dr Richard Messnarz 1 Oct 2021	Joerg Niemann 1 Oct 2021	1	<input checked="" type="checkbox"/>
★ Q&A Session about Fuel Cells (U4.E3)	Michael Krisper 30 Sep 2021	Michael Krisper 30 Sep 2021	6	<input type="checkbox"/>

15. Interactive exercise discussions

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