Training	A1.Sys1 - Introduction to Systems Engineering

Keyfacts

Duration	**3 days**
Language	**English or German**
Setting	**On-site or remote**

Target Group	Engineers who are working in an interdisciplinary environment

Training Goals

The ultimate goal of this training is to learn how to master the challenges of interdisciplinary development. It is designed as entrypoint and trailsign into the topic of "Systems Engineering" and pursues the following goals:

#1 - Problem Understanding
Participants are able to understand the different types of systems and their present and future challenges as basis for deriving individual solution strategies.

#2 - Introduction to Systems Engineering
Participants have an understanding about the the ideas and concepts of "Systems Engineering" as interdisciplinary engineering discipline. They know the state of the art and are able to identify relevant topics and strategies for interdisciplinary development

#3 - Fundamental Systems Engineering Concepts
Participants understand the fundamental engineering concepts required for a Systems Engineering approach. A particular focus is put on Requirements Engineering, Architecture Development,
Component Design, Integration, Verification, Validation (IVV), and modern engineering approaches

#4 - Quality, Dependability, and differences between the disciplines
Participants understand the different challenges introduced by different discipines. A particular focus is put on the understanding of "Quality" and "Dependability" in context of Cyber-Physical Systems together with the corresponding "Quality Assurance" strategies

#5 - The Role of Organizations and invididuals in interdisciplinary development
Participants understand the mutual influence of organizations and architecture. Further, they will be able to reflect on their individual role in context of interdisciplinary development

move to improve

Training Content	**Introduction to Systems Engineering**

Introduction to Systems Engineering
- Characteristics of Cyber-Physical Systems and System-of-Systems
- Systems Engineering as interdisciplinary discipline
- Technical and organizational aspects of Systems Engineering

Requirements Engineering
- Understanding Requirements Engineering as engineering discipline
- Fundamental concepts and methods of Requirements Engineering
- Quality Characteristics and Dependability

Architecture Development
- Fundamental concepts of Architecture
- Architecture Description, Viewpoints and Model Kinds
- Architecture Develpment Methods (Twin-Peaks, Zig-Zag Pattern, FAS)
- Model Based Systems Engineering (MBSE)
- Making good Architectures

Design & Development
- Design for X
- Component Designin an interdisciplinary environment
- Modern Development Logics (e.g., Agile, Continuous-X, DevOps,…)

Integration, Verification, and Validation (IVV)
- Virtual and physical integration
- Constructive, Analytic, and Organizational Quality Assurance

Training Content	**Platform und Variant-Management** •Fundamental Concepts for Platform and Variant-Management •Feature Trees und Variable Architekturen **The Role of Organizations, Leaders, and Experts** •The Importance of Organizations: Conway's Law •The Role of Leaders •The Role of Experts
Learning Methods and Didactics	Combination of theory inputs, discussions, examples and exercises to deepen the learning effect

Your Benefit	One of the main challenges in interdisciplinary engineering is the identification of the "unknown unknowns". This training, designed as introduction and road sign. It provides a structured overview on the fundamental concepts of Systems Engineering. As such, it helps identifying blind spots and shows methods how to overcome particular challenges in interdisciplinary engineering.
Your Trainer	**FH-Prof. Dr. Christian Neureiter** neureiter@successfactory.cc Christian is Professor at the School of Information Technology and Digitalisation at Salzburg University of Applied Sciences. As head of the "Center for Dependable Systems Engineering" he is an expert in this field and has profound knowledge on the matter. Asides his academic role, Christian has 10+ years of experience as consultant and trainer at the Successfactory Consulting group with a particular focus on Leadership, Software, and Systems Engineering related topics.