Systems Engineering, Project Management and Bespoke Training for Industry Professionals in Switzerland and Europe.

www.se-training.net
ABOUT SE-TRAINING

Systems Engineering and Project Management are core engineering disciplines used to enable the delivery of complex projects within schedule and cost expectations.

Delivering complex projects demands cross-functional engineering disciplines such as Systems Engineering, Project Management, Safety Engineering, Product Development and Design Thinking. SE-Training has been founded to offer specifically tailored training courses that support the drive, ambition and success in providing innovative and high quality products and services.

There are a high number of engineering organisations based across Europe with diverse needs; SE-Training addresses these unique needs through structured and bespoke courses provided by expert engineering professionals and academics.
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COURSE MAP AND OVERVIEW

Through our diverse range of Systems Engineering and Project Management courses, we can take you across different engineering domains, or deeper into your current field.
Technical development is concerned with the journey undertaken to upgrade existing products and realize new ones, e.g. how a great idea gets to a launched product and beyond. There are no remaining industries where this is a simple process, involving only a few Stakeholders and clearly defined inputs for the product definition. In today’s world, engineering enterprises must technically develop their products against many potentially detrimental factors such as:

- Ever increasing technical complexity in product developments.
- Key project stakeholders’ rapidly increasing expectations of product performance, functionality and cost.
- New technologies requiring more skills and knowledge.

The courses within this category are aimed at broadening an individual’s understanding of technical development, identifying critical processes and methodologies for improving innovation, managing risks and technical complexity, whilst experiencing critical life cycle phases of a complex product development in a simulated environment.
Learning Outcomes

- To know the origins of Systems Engineering and application of the role.
- To speak competently about the discipline of Systems Engineering.
- To know how to apply Systems Engineering methodologies to complex project developments.
- To know how to optimize Systems Engineering on your project.
- To assess the scope of applying for Systems Engineering professional accreditation, ASEP or CSEP.

Who should attend

- Requirements Engineers
- Systems Engineers
- Project Managers
- Verification Engineers
- Architects
- Development Engineers
- Product Owners

Course Overview

The Systems Engineering foundations course provides a solid background of the core Systems Engineering discipline, including learning and practicing the application of Systems Engineering methodologies, enhancing know-how with an interactive workshop covering detailed user cases.

The course attendance is strictly limited to a ratio of no greater than 6:1 Participants: Presenters, thus enhancing the effectiveness of the training. Given that Systems Engineering needs to be tailored to each participant’s unique needs, increasing the presenter’s availability per participant, is a key quality measure of this training course.

Course Structure

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<thead>
<tr>
<th>Day 1</th>
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<tr>
<td>Introduction to Systems Engineering</td>
<td>Risk &amp; Decision Engineering</td>
<td>Verification and Validation,</td>
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<tr>
<td>Systems Lifecycles, Systems Thinking, Agile SE</td>
<td>Functional Analysis</td>
<td>Critical Analysis of Case Studies,</td>
</tr>
<tr>
<td>Requirements Engineering</td>
<td>Design Implementation</td>
<td>Systems Engineering Documentation</td>
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<tr>
<td>Workshop - topics from the day</td>
<td>Workshop - topics from the day</td>
<td>Workshop - topics from the day</td>
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<td>Test and Feedback</td>
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Product Development

Delivered by Amihud Hari

Course Overview

Defining conceptual design at the very early stages of product development is known to be a major key to the success of new products.

A systematic, step-by-step design method is proposed in this course. Our method integrates, modifies and customises a selection of techniques and tools to provide innovative, fast, efficient and cost effective processes for new product definition and for conceptual design of new products. It is a flexible and integrated process, that is customer driven and can be tailored to the unique needs and requirements of each organization and each project team.

Learning Outcomes

• The participants will learn and practice the principles and tools of the new product development method.
• The participants will improve their ability to initiate and define new needs.
• They will learn methods and tools for engineering design of new, high quality and competitive products.
• They will learn how to initiate and manage development of new products which satisfy a real customer need.

Who should attend

• New Product Definition and Concept Design team members and those involved in support roles.
• Those involved in development of new products like project managers, system engineers, design engineers, marketing or quality managers.
• Managers wishing to understand the benefits of New Product Definition and Conceptual Design methodologies before implementation.

COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
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</table>
| 1   | • Introduction and course overview  
• Identification and analysis of the Voice of Customer (VOC) | • How to use Quality Function Deployment (QFD) for new products definition and specification  
• Action learning on a case-study |
| 2   | • Benchmarking  
• Decisions and Action plan  
• Performance Based Specification (PBS) and System Requirement Review (SRR) | • Abstraction, Functional Analysis  
• Action learning on a case-study |
| 3   | • Creation of principle solutions, Brainstorming, Solutions Evaluation  
• Evaluation Criteria  
• Synthesis of Concepts, Morphologic Matrix | • Concept Evaluation and Selection, Selection Methods  
• Action learning on a case-study |
| 4   | • Architecture and High level design of the Main concepts  
• Operation manufacturing and support decisions  
• Sizing | • Preliminary design Methodologies  
• Conceptual Failure Mode Analysis – CFMA  
• Action learning on a case-study |
| 5   | • Conceptual Design to Cost Analysis - CDTC  
• Final concept selection  
• Design Reviews | • Action learning on a case-study  
• Customization: Tailor your own New Products definition and Conceptual Design program  
• Implementation: From Theory to Practice  
• Conclusion |

www.se-training.net
COTS Based Systems Engineering (CBSE)
Delivered by Amihud Hari

Course Overview

COTS based System Engineering (CBSE) brings fundamental changes in how Systems Engineers do their work. COTS - Commercial Off-The-Shelf Item, can be defined as a non-developmental item (NDI) of supply that is commercial and sold in substantial quantities in the commercial marketplace. Examples of COTS items are: hardware and software assemblies, equipment and subsystems. COTS purchases are alternatives to in-house developments in both the military and commercial domains.

Additional Information

The use of COTS items has been mandated across many government and business programs; as such products may offer significant savings in procurement, development, and maintenance. But in reality, COTS items do not uphold the same quality standards that government-developed systems do. The challenge COTS present to the Systems Engineer is to use these Systems Engineering processes in an environment where the solution space is bounded by the existing functional and physical aspects of the COTS components. This is both a design process and an integration process. The significant aspect introduced by COTS is that the design process is now constrained by a set of pre-existing components, which introduce functionality that may or may not be required by a specific design solution.

Learning Outcomes

The participants in the course will learn how to engineer new COTS Based Systems and the necessary adjustments to the fundamental principles of Systems Engineering (SE) when dealing with COTS Based Systems. In particular they will learn:

- The key characteristics and concepts of CBSE
- Lessons learnt, benefits and challenges using CBSE
- Processes and lifecycles of CBSE
- Requirement Engineering for CBSE
- Test and Evaluation for CBSE
- Architecture, Design and selection for CBSE
- How to Identify and manage COTS Based Systems Risks
- How to manage CBSE

Who should attend

Anyone involved in CBSE with some experience in application of SE or Engineering Design Methodology can benefit from this course. This can include:

- Systems Engineers who use COTS components for their designs.
- Suppliers who produce and supply COTS components (hardware and software).
- Program and project managers that use or consider using COTS components.
- Government/Military/Commercial professionals who work or consider working with COTS-Based systems.

However, this course is an “Advanced Systems Engineering Design” course. A basic course or experience in Traditional SE or Engineering Design Methodology is a prerequisite for attending this course.
# COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
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</table>
| 1   | • Introduction  
• The key characteristics and concepts of CBSE  
• Lessons learnt, benefits and challenges using CBSE  
• Requirement Engineering for CBSE | • Processes and lifecycles of CBSE |
| 2   | • Architecture, Design and selection for CBSE  
• CBSE Risk Management | • Test, Evaluation and Integration for CBSE |
| 3   | • COTS Assembly Management Plan (CAMP)  
• Other aspects of using CBSE | • Projects presentation  
• Conclusion |

## THE CBSE PROCESS

by Amihud Hari

[Diagram of the CBSE process]

- **Concurrent Decisions and Trade-offs**
- **Customer and Stakeholder Needs and Requirements**
- **Marketplace Study and Product/Supplier Evaluation**
- **Program Life-Cycle Goals, Constraints and Risks**
- **Design Architecture, Integration and Test**
Systemic and Systematic Requirements Engineering and Management
Delivered by Joe Kasser

Course Overview

This course equips participants with the appropriate understanding of the difficulty of writing good requirements, the use of requirement management as an approach for controlling change and measuring the degree of completion of a project over the development, build, test and deliver, portion of the system and software life cycle.

The course uses a mixture of active and passive teaching styles to maximize the effectiveness of the learning opportunity. Participants will be provided with a software tool (Tiger Pro) specially developed as an educational tool with which to write and test requirements.

Learning Outcomes

- Understand the importance of well-written requirements
- Understand why requirements errors cost more to correct than other types of errors in the system development process.
- Deal with poorly written requirements.
- Recognize poorly written requirements and be able to repair them. Create clear and concise well-written requirements.
- Mitigate the effect on cost and schedule due to poorly written requirements.

Who should attend

- Personnel who specify the development of technology-based systems.
- Engineers and programmers elucidating requirements from customers.
- Designers who work with poorly written requirements.
- Software and hardware testers who need to figure out how to test requirements.
- Acquisition managers, contract specialists.
- Other personnel performing similar roles.

COURSE STRUCTURE

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<td>Sessions 2-5</td>
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<td>Perceptions of requirements from:</td>
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<td>• The Big Picture Perspective</td>
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<td>• The Structural Perspective</td>
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<td>• The Functional Perspective</td>
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<td>• The Operational Perspective</td>
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<td>Perceptions of requirements from:</td>
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<td>• The Temporal Perspective</td>
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<td></td>
<td>• The Generic Perspective</td>
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<td>• The Continuum Perspective</td>
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<td>• The Quantitative Perspective</td>
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<td>• The Scientific Perspective</td>
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<td>Session 11 - Summary and closeout</td>
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# COURSE STRUCTURE - DETAILS

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<tr>
<td><strong>Session 0 – Introduction</strong></td>
<td><strong>Session 6 - Perceptions of requirements from the Temporal Perspective</strong></td>
</tr>
<tr>
<td>• To introduce the workshop, instructor and participants</td>
<td>• To understand how requirements are used in each state of the system lifecycle</td>
</tr>
<tr>
<td>• To provide administrative details</td>
<td>• To understand how to determine which requirements should be implemented early in the system lifecycle</td>
</tr>
<tr>
<td>• To explain the experiences that led to the development of the workshop</td>
<td>• To learn how to manage changing requirements</td>
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<td></td>
<td>• To learn how to quickly manage the effect of cost reductions</td>
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<td></td>
<td>• To learn about CRIP charts</td>
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<tr>
<td><strong>Session 1 – Systems thinking and beyond</strong></td>
<td><strong>Session 7 - Perceptions of requirements from the Generic Perspective</strong></td>
</tr>
<tr>
<td>• To understand systems thinking, systemic thinking and systematic thinking</td>
<td>• To understand the similarity between writing requirements and writing change requests during the system lifecycle</td>
</tr>
<tr>
<td>• To understand the Perspectives Perimeter</td>
<td>• To understand how to inherit requirements from the same class of system</td>
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<tr>
<td>• To understand the Holistic Thinking Perspectives</td>
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<tr>
<td><strong>Session 2 – Perceptions of requirements from the Big Picture Perspective</strong></td>
<td><strong>Session 8 - Perceptions of requirements from the Continuum Perspective</strong></td>
</tr>
<tr>
<td>• To understand the perennial problem of poor requirements</td>
<td>• To understand the difference between requirements, needs and goals</td>
</tr>
<tr>
<td>• To understand the purpose of a requirement.</td>
<td>• To understand each of the different types of requirements</td>
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<tr>
<td>• To understand the place of requirements in the project lifecycle.</td>
<td>• To understand the difference between system specific and system generic requirements and how they are used</td>
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<tr>
<td>• To learn where requirements are produced.</td>
<td>• To learn about the ‘A’ and ‘B’ requirements paradigms</td>
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<tr>
<td>• To learn when and how requirements are used in the systems lifecycle</td>
<td>• To understand how the two requirements paradigms influence eliciting and elucidating requirements</td>
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<tr>
<td>• To create a small system based on a set of requirements</td>
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</tr>
<tr>
<td><strong>Session 3 - Perceptions of requirements from the Structural Perspective</strong></td>
<td><strong>Session 9 - Perceptions of requirements from the Quantitative Perspective</strong></td>
</tr>
<tr>
<td>• To understand the difficulty of writing good requirements</td>
<td>• To understand the numbers associated with requirements and their sources</td>
</tr>
<tr>
<td>• To understand the structure of a requirement.</td>
<td>• To understand how to determine when there are enough requirements</td>
</tr>
<tr>
<td>• To understand and use Standards applicable to requirements in the system lifecycle</td>
<td>• To understand how to reduce the number of requirements on a project</td>
</tr>
<tr>
<td>• To learn the grammar of a requirement statement</td>
<td>• To systemically and systematically measure the quality of a requirements specification</td>
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<tr>
<td>• To write a set of requirements</td>
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<tr>
<td>• To understand and create acceptance criteria for requirements</td>
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<tr>
<td>• To understand the nature of and use of priority, cost, schedule, risk and other attributes of requirements</td>
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<tr>
<td><strong>Session 4 - Perceptions of requirements from the Functional Perspective</strong></td>
<td><strong>Session 10 - Perceptions of requirements from the Scientific Perspective</strong></td>
</tr>
<tr>
<td>• To understand the role of requirements analysis (requirements capture and requirements validation) in achieving successful project outcomes</td>
<td>• To understand how the object-oriented approach can reduce the number of requirements on a system</td>
</tr>
<tr>
<td>• To learn how to write requirements for commercial-off-the-shelf (COTS) equipment</td>
<td>• To think about requirements engineering as a project management paradigm</td>
</tr>
<tr>
<td>• To analyze and evaluate requirements</td>
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<tr>
<td>• To learn how to validate and test requirements especially poorly written requirements</td>
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<tr>
<td><strong>Session 5 - Perceptions of requirements from the Operational Perspective</strong></td>
<td><strong>Session 11 - Summary and closeout</strong></td>
</tr>
<tr>
<td>• To understand and practice ways of identifying and managing stakeholders and their requirements, especially when...</td>
<td>• To summarize the workshop</td>
</tr>
<tr>
<td>• To learn ways of identifying and capturing requirements to maximize the completeness of the requirements</td>
<td>• To outline the next steps – starting to apply the knowledge gained in the workshop</td>
</tr>
<tr>
<td>• To understand the purpose of the Systems Requirements Review</td>
<td>• To close out the workshop</td>
</tr>
<tr>
<td>• To understand how requirements shape other milestone reviews in the system lifecycle</td>
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<tr>
<td>• To learn to flow requirements down from system to subsystems or units</td>
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<tr>
<td>• To create a partial project plan based on a set of requirements</td>
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</table>
Organising people to achieve an enterprise’s goals in a structured way whilst repeatedly yielding excellence in product development, product support and customer satisfaction through their established working processes and unique culture is a continuously demanding cycle. This is further exacerbated by competitors attracting key Personnel away, the changing needs of today’s workforce, the constraints imposed by regulatory bodies and authorities and the demands of achieving all the aforementioned whilst also being Innovative, Lean and Agile.

The courses within this category are aimed at guiding Individuals to implement and mature engineering practices within their organisations and continuously improving their core engineering processes.
SE Management
Delivered by Mike Johnson
Course Overview
The target audience for SE Management are people working in engineering management roles, such as: Research and Development Managers, Systems Engineering Managers, Design and Development Managers or any such role that involves implementing engineering organisational strategies and/or involves high interactions with the Systems Engineering leaders.

The course attendance is strictly limited to a ratio of no greater than 6:1 Participants: Presenters, thus enhancing the effectiveness of the training. Given that Systems Engineering needs to be tailored to each participant’s unique needs, increasing the presenter’s availability per participant, is a key quality measure of this training course.

Learning Outcomes
• Understanding the value of Systems Engineering.
• How to establish an SE led organisation.
• Effectively implement processes to support a SE organisation.
• Implement SE roles and responsibilities and a SE professional development strategy.
• Integrate SE as a core discipline in the organisation, knowing how SE interacts from an inter-disciplinary perspective.

Who should attend
• Team Leaders & Department
• Department Heads in Engineering
• Engineering Process Owners
• Quality Managers

COURSE STRUCTURE

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<tr>
<td>• Overview of Systems Engineering discipline</td>
<td>• Overview of organisational structures</td>
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<tr>
<td>• Systems Engineering roles and responsibilities</td>
<td>• Establish a Systems Engineering led organisation</td>
</tr>
<tr>
<td>• Inter-disciplinary interfaces to Systems Engineering</td>
<td>• Effectively Implementing and monitoring processes</td>
</tr>
<tr>
<td>• Systems Engineering competencies</td>
<td>• Systems Engineering KPI’s</td>
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<td></td>
<td>• Systems Engineering professional development strategy</td>
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OTHER COURSES ON MANAGEMENT

SYSTEMS APPROACH ON PROJECT MANAGEMENT

COMPLEXITY IN PROJECT AND PROGRAMME MANAGEMENT

www.se-training.net
Improving the Result of Reviews and Inspections
Delivered by Niels Malotaux

Course Overview

Document inspections are one of the most economical and necessary techniques for eliminating and, more importantly, preventing defects. Reviews are often done, but produce only a fraction of the really important defects that should be found. With only a few hours of proper Inspection training, people can find many more faults in a document, where they first found only one or two minor issues. This should give evidence that with proper education Reviews and Inspections can, indeed, provide the benefits promised.

Learning Outcomes

- What are the various Review & Inspection approaches
- When to use which approach, and why
- How to inspect documents more thoroughly
- How to organize effective reviews/inspections efficiently
- How to prevent emotional conflict during reviews
- How to calculate the ROI on reviews and inspections
- How to solve the issues found as efficiently as possible
- How to prevent the issues found from recurring.

Who should attend

This course is intended for those who produce and evaluate documents, such as:

- Contracts
- Business Proposals
- Requirements
- Case Studies
- Story Cards
- Designs
- Drawings
- Code
- Test Plans

Preparation

Bring three copies of one or two pages of a document that is not too confidential and being used in your current project, perhaps even already reviewed in the usual way. Then you will show yourself the power of proper Inspections.

Warning: after the Inspection you may decide to discard your document as unacceptable!

Course Structure

This is a One-Day Masterclass in which the following topics will be covered:

- Goal of reviews
- Bad reviews
- What is quality
- What are defects
- Zero Defects
- Review types
- Exercise on your own document
- Early inspections
- Organizing reviews
- Calculating Return on Investment
- Discussion

OTHER ONE-DAY MASTERCLASSES

CONFIGURATION MANAGEMENT
Seb Klabes

COMPLEXITY IN PROJECT AND PROGRAMME MANAGEMENT
Dave Snowden

www.se-training.net
There are many approaches to initiating, planning, executing, controlling, and closing the work of a project team to achieve specific goals and meet pre-defined criteria within a specified time.

SE-Training’s philosophy for Project and Programme management is to provide a broad catalogue of courses that take on unique perspectives. The aim is to add value for the Individual by addressing and understanding perspectives such as, the systematic approach, addressing complexity in addition to simply delivering excellent project results on time.
Quality on Time

Delivered by Niels Malotaux

Course Overview

We will study and exercise techniques on how to continuously improve our effectiveness and efficiency, how to predict what will have been achieved, by when and thus be prepared to face the result by solving the discipline problem, exploiting our intuition mechanism, continuously balancing priorities, keeping focus, coping with differences in disciplines and cultures, adopting a Zero-Defect attitude and, ultimately, preventing any stakeholder’s complaints.

Are you already doing all these things and do you think you are already very effective and efficient? That’s what other people thought before they found out otherwise.

Learning Outcomes

• How to define the real requirements
• How to select the right solutions
• How to know what you can promise and then deliver as promised
• How to optimize efficient communication among people in projects

In short: how to deliver the right things at the right time

Preparation

In preparation for the course, please consider the following:

• The goal of your current work or project
• The definition of success
• Who is the most important stakeholder in your project, and what is their primary requirement?
• How much value improvement does this stakeholder expect?
• Any deadlines? (No deadlines = longer completion time!)
• What does your team expect to achieve in the next 10 weeks? Is it attainable? How do you make it attainable?
• What does your team expect to achieve by the end of this week? How do you ensure this?
• What issues have you anticipated for the project?

If you find it difficult to write these things down, this course is even more important for you.

Hopefully, the course makes you refine some of your answers, which will free you up to work less on unimportant things and achieve better focus on what is really important, immediately saving time.

Who should attend

This course is intended for:

• Systems Engineers
• Project Managers
• Architects
• Developers
• Product Owners
• Scrum Masters

QA people who find it important to deliver Quality On Time: the right results at the right time, no excuses needed. Management will benefit because they’re responsible for the result; all others will benefit because they determine the result.

COURSE STRUCTURE

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Systemic and Systematic Project Management

Delivered by Joe Kasser

Course Overview

This course defines a holistic approach to project management for the development of new complex techno-centric systems. The emphasis is on the relationships and interconnections between project management processes and systems engineering processes for new complex systems. Specific topics include change management, strategy, project organization, team development, leadership styles, priorities, task development, scheduling, cost estimation, performance monitoring, constraint management, and project audits. Students apply these concepts on a project while working in teams. Mastery of these key tools is important for career development, as projects are a major approach for organizations to achieve their strategic goals.

Learning Outcomes

• Understand and be able to apply the systems approach to project management.
• Know the methodology of project planning, monitoring and control.
• Know how the methodology is applied.
• Be able to plan and validate plans for techno-centric systems.
• Be able to anticipate, plan and manage change in systems development projects.

Who should attend

• Managers and engineers who wish to sharpen their project management skills in managing the development of increasingly complex techno-centric systems.
• Managers looking for a better way to manage.
• Managers facing complicated problems.
• Managers wanting to improve their thinking and communication skills.

Course Structure

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<td>Performance monitoring</td>
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<td>Management: General and project</td>
<td>Project scheduling</td>
<td>Risk Management</td>
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<td>Introduction to Case Study Project</td>
<td>Project costing</td>
<td>Change management I (PDR)</td>
<td>Change management III (TRR)</td>
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<td>Project planning</td>
<td>Reducing project schedule and cost</td>
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<td>Human side of project management</td>
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<td>Change management IV (DRR)</td>
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<td>Project planning exercise</td>
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<td>Summary and closeout</td>
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www.se-training.net
Complexity in Project and Programme Management
Delivered by Dave Snowden

Course Overview
Dave Snowden, the founder of Cognitive Edge and creator of the Cynefin framework will be using this one day Master Class to show how, in the discipline of Project and Programme Management, complexity can be reduced, managed and effectively controlled.

Additional Information
The Cynefin framework has now been used around the world in contexts as diverse as the boardrooms of international fashion houses, software development teams and SWAT teams on the city streets. Decision-makers have applied it across all levels of organisation and in almost every industry.

The original use in Knowledge Management (Complex Acts of Knowing) was recently assessed as the third most cited article in the field and the HBR cover article on its application of Leadership has won multiple awards. It was assessed as the first practical application of complexity science to business issues. It was more recently used in the Prince II Agile publication with direct application to project management. A new multi-client programme is about to commence to develop methods and tools for a new release of Prince II looking at the wider body of knowledge and practice. Complexity is a major paradigm shift from systems thinking which has dominated the last few decades and works from a basis in natural science, and is an ecological, not an engineering, metaphor for the organisation and its market.

Learning Outcomes
• To understand the basics of the Cynefin framework and its application to Project and Programme Management.
• To know how to apply several methodologies for navigating complexity.
• To understand the intricate links between complexity and project management.
• To understand new methods of mapping attitudes (lead indicators) as opposed to compliance (a lag indicator) and the role of anticipatory alerts in programme management.
• An appreciation of ‘fractal’ or real time multi-layered representation of organisational and programme culture and its impact on performance.

Who Should Attend
• Project managers
• Academics interested in the subject
• Managers with relevant responsibilities

Course Structure
This is a One-Day Masterclass that focuses on the theory and applicability of the Cynefin Network to manage complexity.

www.se-training.net
Cradle-to-Grave Life Cycle Analysis

Course Overview

This workshop is based on the use of a total cost of ownership model that primarily considers the operational life of the equipment and the services that are needed to keep it operational and relevant to the owner/operator. The fundamental assumption is that businesses’ requirements for equipment and accompanying technology changes over time. Using an avatar, the equipment’s cradle-to-grave life-cycle is built up. Within this model, issues such as change of ownership and the implications this generates are also considered.

Additional Information

From the cradle-to-grave equipment life-cycle, you will build up a total cost of an ownership model based on the tasks that the owner/operator has to perform to keep the asset ‘productive’. The tasks or jobs are initially not allocated – the assumption is that they need to be delivered to keep the machine productive. Value propositions will be created for each job and a visual life-cycle created. From the life-cycle you will then learn more about how you can use the model to maintain a valuable cash flow from the equipment over its total operational life.

Learning Outcomes

• You will be able to build a detailed total cost of ownership model for both new and existing products.

• To be able to create a value proposition that is applicable to all jobs that identified over the cradle-to-grave life-cycle.

• To learn how to use the model on a strategic marketing basis.

• To learn how you can support your firm on a tactical basis.

Who Should Attend

• Managers and leaders who are responsible for service delivery, service design and after sales.

• Managers and leaders in new product development and business development.

Course Structure

This is a One-Day Masterclass that focuses on the following topics:

• Introduction to the model

• Building a cradle to grave model for complex engineered systems

• Identifying and development of new value propositions using the model

• Extension to the model to learn new insights

OTHER COURSES BY SHAUN WEST

Cradle to Grave Life Cycle Analysis, Servitization: an Introduction, and Customer Journey Mapping may be delivered by Shaun West or any of his following colleagues: Petra Müller, Günter Zepf or Jürg Meierhofer.
Customer Journey Mapping

Delivered by Shaun West

Course Overview

Customer journey mapping is a key part of developing and improving the customer experience, which is critical to long-term sustainable business relationships. The mapping process provides deep and actionable insights into the customers’ touchpoints, which with digital services are becoming ever more critical and complex to manage in our multi-channel world. The process moves behind the rational swimlaning approach to process management, including emotional aspects. The customer/user is the focus of the process, providing the opportunity to then understand how support services help (or otherwise) the customer to achieve the outcomes that are important to them.

Additional Information

The customer journey map allows you to see the world as your customer experiences the world. We will map out a customer journey starting and ending outside of the normal boundaries of the supplier. You will discover what delights your customers and learn why it delights your customers. You will find areas that add no value – only cost – and should be removed; you will learn the value of service recovery and how turning a bad experience into a good one delights your customer; you will find areas where your staff need more empowerment to provide better customer experiences.

Learning Outcomes

• To be able to understand and recreate the customer’s end-to-end journey.
• To find tasks that add no value to your customer’s or your businesses.
• To understand how to integrate multi-channel/multi-point of contacts into a coherent customer journey.
• To be able to learn how empowerment of your staff can improve the customer experience and reduce your costs.

Who Should Attend

Managers and leaders who are responsible for service delivery, service design and after sales.

Course Structure

This is a One-Day Masterclass that focuses on the following topics:

• Introduction to Service Design
• A case of Customer Journey Mapping
• Developing your own Customer Journey map
• Identifying improvements to the customer journey

OTHER COURSES BY SHAUN WEST

Cradle to Grave Life Cycle Analysis, Servitization Introduction and Customer Journey Mapping may be delivered by Shaun West or any of his following colleagues: Petra Müller, Günter Zepf or Jürg Meierhofer.

www.se-training.net
Project Managers’ Essentials
Delivered by Piet Belgraver

Course Overview

The project management essentials course provides a solid background of the core of the Project management discipline. It includes the learning and practicing the application of the Project management methodologies, knowledge areas and enhancing know-how with an interactive workshop covering Project life-cycle and project management knowledge areas.

The course attendance is limited to a ratio of no greater than 6:1 Participants: Presenters, thus enhancing the effectiveness of the training.

Learning Outcomes

- To know the project life-cycle and framework
- To know the major project management knowledge areas as scope, time and cost
- To understand resource and quality management
- How to implement project risk management and mitigation strategies
- To effectively communicate within and outside the project

Who should attend

- (Novice) Project Managers
- Members of PMO
- Systems Engineers

COURSE STRUCTURE

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<td>Introduction to Project Management</td>
<td>Project Controlling</td>
<td>Quality &amp; Risk</td>
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<td>Project Setup</td>
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<td>Scope, Time, Cost</td>
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<td>Workshop day topics</td>
<td>Workshop day topics</td>
<td>Wrap up &amp; feedback</td>
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</table>

www.se-training.net
Additional Information

Interviews of scores of experienced major project managers and leaders of project companies revealed that PM literature and training focus on the science or process of PM. While the actual result is insured by the “art” of PM.

Our experience is strongly in agreement with the need for “art” and the “science” of PM.

Company Results in like industries or divisions within Companies are 20% - 33% higher when the right organizational climate is present. “Healthy” companies increased their earnings by 18%.

Leadership style is part of the “art” of project execution.

Learning Outcomes

• Understanding of the importance of both the art and science of project management
• Ability to identify when art is more important than science
• Ability to identify when science is more important than art
• To understand that ‘it is not just about process’; it is also about people. Ability to balance process with human factors.
• Ability to effectively reflect on both colleagues and one’s own experiences.

Who Should Attend

• Anyone who leads projects.
• Anyone who is part of a project team
• Experienced Project Managers and team members who want to improve their effectiveness
• New hires who need to understand Project Management

Course Structure

This course is available in three different programmes:

• A One Day Introduction Programme that introduces participants to the art of project management.
• A Two Day Immersion programme that explores the art of project management in more depth.
• A Five Day Block Week, which fully explores the depth and breadth of the art and science of project management.

The 5-Day Block Week will run on consecutive days. The first day of the block week constitutes the Introduction Programme, and participants may choose to only attend this first day.

The first two days of the block week constitutes the Immersion Programme, and participants may choose to only attend the first two days.

Participants may also choose to complete the full 5 days.

Please see the following pages for course details of each programme.
Creativity and Project Management

INTRODUCTION: 1 DAY
Delivered by Shaun West and Jim Siler

Course Overview
This One-Day course constitutes the first day of the 5 Day Block Week Programme. Participants may choose to attend this first day only.

In this programme, practical examples will be used alongside videos to support classroom learning-by-doing. The focus will be on introducing participants to the ‘art’ of project management, linking each concept with the known ‘science’ of project management.

COURSE STRUCTURE

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<th>Session 1</th>
<th>What do you know?</th>
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<td>• Best practice for effective project management</td>
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<td>Session 2</td>
<td>Project Management</td>
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<td>• Controlling</td>
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<td>• Reporting</td>
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<td>• Leadership and Culture</td>
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<td>Session 3</td>
<td>Reflection on the day</td>
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<td>• Lessons learnt</td>
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<td>• What could you use?</td>
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<td>• What was not understood?</td>
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</table>

“You can’t write enough rules to manage complexity; you can write procedures to manage things that work in a logical way, but as risk and complexity increases, it is not sufficient. Leadership is required.”

- Hilary Mercer
# Course Overview

This 2-Day course constitutes the first 2 days of the 5 Day Block Week Programme. Participants may choose to attend these two days.

In this programme, practical examples will be used alongside videos to support classroom learning-by-doing. The focus will be on introducing and immersing participants to the ‘art’ of project management, linking each concept with the known ‘science’ of project management.

## Course Structure

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<td><strong>Session 1</strong></td>
<td>What do you know?</td>
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<td></td>
<td>• Project Management Challenges</td>
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<td>Project Management</td>
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<td>• Leadership and Culture</td>
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<td><strong>Session 3</strong></td>
<td>Reflection on the day</td>
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<td>• Lessons learnt</td>
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<td>• What could you use?</td>
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<td>• What was not understood?</td>
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</table>

“Leaders fail when they don’t spend enough time having the right conversation and role modeling the desired behaviours, but rather reporting and doing paperwork”

- Roberto Charron
Creativity and Project Management

FULL BLOCK WEEK: 5 DAYS
Delivered by Shaun West

Course Overview

This 5-Day course constitutes the full 5 Day Block Week Programme.

In this programme, practical examples will be used alongside videos to support classroom learning-by-doing. The focus will be on exploring the depth and breadth of the ‘art’ of project management, linking each concept with the known ‘science’ of project management.

COURSE STRUCTURE

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<th>Day 1</th>
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<tbody>
<tr>
<td><strong>Session 1</strong></td>
<td><strong>What do you know?</strong></td>
<td><strong>Apollo 13 – Bring them home</strong></td>
<td><strong>Critical Problem Solving</strong></td>
<td><strong>Different Types of Projects</strong></td>
</tr>
<tr>
<td></td>
<td>• Project Management Challenges</td>
<td>• Challenge</td>
<td>• Creativity in Projects</td>
<td>• Each team is given a different project brief</td>
</tr>
<tr>
<td></td>
<td>• Best practice for effective project management</td>
<td>• Team Work</td>
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<td>• NASA Video</td>
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<td></td>
<td></td>
<td>• Pathfinder - Execution lessons and creativity (it’s about people!)</td>
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<tr>
<td><strong>Session 2</strong></td>
<td><strong>Project Management</strong></td>
<td><strong>Wind Turbines in Antarctica</strong></td>
<td><strong>Team Building</strong></td>
<td><strong>Project Management in Services</strong></td>
</tr>
<tr>
<td></td>
<td>• Controlling</td>
<td>• Team Management</td>
<td>• The Art of Communication</td>
<td>• External Customers</td>
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<tr>
<td></td>
<td>• Sharing</td>
<td>• Risk Management</td>
<td></td>
<td>• Internal Stake Holders</td>
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<td></td>
<td>• Reporting</td>
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<td>• Leadership and Culture - why they matter.</td>
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<tr>
<td></td>
<td>• Leadership and Culture</td>
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<tr>
<td><strong>Session 3</strong></td>
<td><strong>Reflection on the day</strong></td>
<td><strong>Reflections on the two days</strong></td>
<td><strong>Reflections on the three days</strong></td>
<td><strong>Closing and reflections on the week</strong></td>
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<tr>
<td></td>
<td>• Lessons learnt</td>
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<td>• What could you use?</td>
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<td>• What was not understood?</td>
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</table>
Engineering for the speciality disciplines, commonly referred to as the “ilities” – and also known as Quality Attributes – requires a mature knowledge and understanding of the inter-dependencies of these critical disciplines, in order to achieve the intended performance, functionality and Customer expectation from a product. Customers often expect all of the “ilities” to be perfect within a product, often leading to unrealistic constraints on the project team.

In many infamous cases, engineering projects have failed due to underestimating “ilities” such as reliability and product safety. In addition to being the cause of failed projects, they are also often linked to very poor product launches when not optimized at the time of release, leading to very expensive retrospective engineering activities.

SE Training’s philosophy is to offer courses to maximize the return of investment of the course attendees. The primary focus on the subjects covered in the course catalogue is that they cover difficult to predict attributes which are in turn expensive and time consuming to change retrospectively. The courses address these subjects which generally are poorly understood, notably regarding the available processes, tools and methodologies.

In addition, in the field of domain specific courses, the approach is to target niche subjects. For instance, the course on Acoustics Systems Engineering is the only one in the world addressing this subject from the Systems perspective.
**Fundamentals of Systems and Product Safety**

Delivered by Jim Mateer and Richard Maguire

**Course Overview**

This course will provide attendees with a solid foundation in the motivations for and techniques associated with designing safer systems and products. We will review a variety of real life accidents and explore their root causes, to highlight that organisational failings, design errors and operational issues have the capacity to create catastrophic events. Within an SE approach, we’ll explore methods to assess safety and human factors risks for a set of technologically diverse systems before considering how to define design requirements to control potential hazards. The course will also provide an overview of safety management systems, hazard logs, safety arguments, incident investigation, complex electronics safety (including software), CE marking and hazardous materials.

**Learning Outcomes**

- Gain an understanding of what “safe” means, the business and project benefits linked to robust safety management and the cost of accidents.
- Be able to outline the key elements associated with “designing for safety” for all stages of a product’s life-cycle.
- Have an overview of the tools and techniques employed by safety specialists when adopting a risk based approach to safety.
- Have an appreciation of the safety issues associated with software, human/system interactions, novel technologies, complex system of systems and autonomy.

**Who should attend**

- Design engineers wishing to improve or refresh their system safety knowledge to enhance their integration within a Systems Engineering team.
- Project and programme managers wishing to understand how poor safety engineering can lead to prohibitive project risk.
- Engineering managers wishing to improve their specialist knowledge in order to gain the most from their safety team.
- Business leaders wishing to understand their legal and moral responsibilities to ensure that products and systems are designed, commissioned and operated safely.

**COURSE STRUCTURE**

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
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<tbody>
<tr>
<td>• What is “Safe”?</td>
<td>• Project Safety Engineering Activity Breakdown</td>
</tr>
<tr>
<td>• Terminology of Safety</td>
<td>• Safety Requirements and CE Marking</td>
</tr>
<tr>
<td>• Legal Framework, Regulation, Standards</td>
<td>• Arguing Safety</td>
</tr>
<tr>
<td>• Safety Management (Systems)</td>
<td>• Accidents Review 2</td>
</tr>
<tr>
<td>• Accidents Review</td>
<td>• Human Factors</td>
</tr>
<tr>
<td>• Risk Based Approach to Safety – Overview</td>
<td>• CEEE &amp; Software Safety</td>
</tr>
<tr>
<td>• Tools and Techniques</td>
<td>• Novel Technologies</td>
</tr>
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<td></td>
<td>• Autonomous Systems/Human Replacement Functions</td>
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<td></td>
<td>• Future Challenges</td>
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</tbody>
</table>

www.se-training.net
The System Reliability course provides in depth knowledge and training on the analysis and modelling of systems reliability. The participants will firstly be introduced to the relationship between reliability, availability and maintainability. They will learn how to manage availability and maintainability while analysing and determining the system’s reliability. The participants will not only learn about the concepts but will deepen their understanding through workshops.

Learning Outcomes

- Participants know how to analyse, model and predict system reliability.
- Participants understand the common reliability terminologies and commonly used reliability models.
- Participants learn and practice:
  - Functional Failure Modes, Effects, & Criticality Analysis (FMECA)
  - FMECA's for Electro-mechanical systems
  - Analysis, prediction and monitoring of system reliability

Who Should Attend

- Engineers
- Quality Assurance Managers
- RAM Managers
- Reliability engineers and anyone who needs to assure and/or analyse system’s reliability.

COURSE STRUCTURE

**Day 1**

- Introduction to reliability concepts and reliability models
  - Foundations
  - Repairable vs. unrepairable
  - Series, redundancy, redundancy with spares
  - System design
  - Redundancy architecture
  - Failure mode propagation

- Calculation, Analysis and Prognosis of Reliability
  - Mathematical Definitions
  - Example Calculations
  - Probability modelling
  - Simulation of wear
  - Environmental conditions
  - Fault impact classes
  - Reliability block diagrams
  - Fault tree analysis
  - FME(C)A
  - Structure of FMECA

- Failure Modes and its use in FMECA
  - Functional FMECA
  - Electrical FMECA
  - Electro-mechanical FMECA
  - Mechanical FMECA

- Workshop on Functional FMECA

**Day 2**

- Assuring Systems Reliability
  - Planning of reliability related activities
  - Execution and monitoring of reliability related activities
  - Characteristics of a good FMEA process
  - Criticality analysis
  - Single point failures
  - Critical item list

- Providing Evidence of Systems Reliability
  - Reliability documentation
  - Reliability monitoring
  - Feedback processes from utilization to design
Acoustics Systems Engineering

Delivered by Nick Eaton

Course Overview

Acoustics involves the generation of noise, its transfer through solid structures and fluids, and then the response of the receiver (a person or equipment). Application of Systems Engineering techniques is essential before an efficient and effective result can be achieved.

Additional Information

Usually the objective is to control the response to an acceptable level at a minimum added cost, weight or size. Often the details are complex, the number of variables is high, and conflicting constraints operate. Application of SE techniques is essential before an efficient and effective result can be achieved.

The main principles will be introduced, with detailed information included in the hand-outs. Their application is explained using practical examples and reinforced by hands-on examples for familiar acoustics problems.

Who Should Attend

This course is ideally suited to mechanical, civil, electrical, medical equipment and aerospace system engineers who need to understand and show compliance with acoustics requirements, integrate acoustics into product design and gain winning sound quality for their product.

Learning Outcomes

• To understand essential acoustics theory
• To be able to break down any problem into simpler components and interfaces
• To apply the V model to acoustics, guided by practical examples
• To be able to use freely available spreadsheet tools, applications and data references to support the SE in acoustic problem solving and optimisation
• To develop creative approaches to acoustics, noise and vibration control
• To be able to find solutions for a typical problem such as reduction of noise in a machine environment to comply with safety regulations
• To gain confidence in tackling diverse acoustics situations encountered in real-world engineering

COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
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<tbody>
<tr>
<td>1</td>
<td>• Introduction to sound and vibration.</td>
<td>• Introduction to analysis tools.</td>
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<td></td>
<td>• Criteria and metrics for sound disturbance and effects.</td>
<td>• Introduction to references and useful sources of information.</td>
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<tr>
<td></td>
<td>• Systems Engineering applied to sound and vibration problems.</td>
<td>• Demonstration of sound characterisation in a meeting room.</td>
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<td>• Recap and short exercises.</td>
<td>• The “V” model, acoustic guided tour.</td>
</tr>
<tr>
<td>2</td>
<td>• Example of acoustic system engineering in practice – VIP transport vehicle.</td>
<td>• Integration Management, Validation, Commissioning and Lifecycle</td>
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<td></td>
<td>• Requirements, Concepts, Tradespace and Selection, Concurrent Engineering.</td>
<td>• Alternative to conventional methods; Active Control, etc.</td>
</tr>
<tr>
<td></td>
<td>• Exercise; vehicle sound control at minimum weight and cost</td>
<td>• Approaches to tackling any real-world problem, methods and examples</td>
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</tbody>
</table>
Servitization
Delivered by Shaun West

Course Overview

The transition of product-based business into a more balanced product and service business is in no way a simple change. It is not as simple as delivering new products to the market as it requires new processes and approaches that can run counter to the existing manufacturing businesses. The aim of this introductory two-day workshop is to introduce the reasons why services are important and then to provide examples of seven challenges that can prevent/delay the delivery of new services.

Additional Information

During the two days, you will identify what concrete steps you could carry out in your own company for the introduction and optimization of services. You will then be able to assess the possibilities of product service transformation and tackle concrete implementation steps to kick-start your service development activities so that they are in line with your customers outcomes and your capabilities.

Who Should Attend

• Managers and leaders who are responsible for service delivery, service design and after sales.
• Managers and leaders in new product development and business development.

Learning Outcomes

• To understand the importance of customer service and how it can help your firm and your customers.
• To be able to define the role of customer support for your products and how it helps improve rebuy chances.
• Be able to identify what forms of customer support are valuable to you and your customers.
• To leave with a list of quick-wins to help you improve your service delivery.

COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
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</thead>
</table>
| 1   | • What is servitization (in the context of an industrial firm)?  
    • How can we measure service culture | • Exploring examples of servitization in the digital world  
    • Showing how servitization supports new product sales |
| 2   | • Customer value proposition in services  
    • Ecosystems and market segmentations | • Service selling and pricing  
    • Delivering services via modularity. |

www.se-training.net
Configuration Management

Delivered by Seb Klabes

Course Overview

Managing the complexity of products along their lifecycle is an increasing challenge in many industries. Knowing and controlling the state of mechatronical systems during development, in the supply chain and after sales is a basic requirement for today’s manufacturer. Manifold requirements set by customers and regulatory bodies, paired with an increasing number of product variants set challenges for managing product data, documentation and changes along the product’s lifetime.

Additional Information

Configuration Management helps to manage this complexity and to enable efficient development and operations of systems.

• The objectives of Configuration Management are to:
  • Manage all relevant product data and documentation in the product context
  • Provide a consistent and complete view about all product components and their valid documentation along the lifecycle phases (Analysis, Feasibility, Development, Implementation and Manufacturing, Operations and Service)
  • Integrate the product data management in the product lifecycle processes (development, testing, supply chain, operations, logistics, maintenance)
  • Manage product variants, changes in the product’s definition and configuration baselines
  • Support efficiency in the value chain.

Learning Outcomes

• Understanding product lifecycle from the perspective of the product’s data.
• Understanding the requirements for managing product data according to the individual needs of an industrial company or a specific project.
• Getting familiar with common terms, methods and approaches required to understand in order to set up a proper Configuration Management process in your project.
• Experiencing the challenges in product data management based on a simple mechatronic system example.

Who Should Attend

• Systems Engineers
• Development Engineers
• Project Leads
• Requirement Engineers
• Verification and Validation Engineers
• Quality Engineers

Course Structure

In this One-Day Masterclass a basic understanding will be provided about how Configuration Management supports each stage of the product lifecycle starting with the first product idea until retiring complex industrial systems. The following topics will be covered:

Introduction of Configuration Management
• What is Configuration Management and how is it related to Systems Engineering
• Requirements for managing product data according to the individual needs of an industrial company or a specific project.
• Explore the product lifecycle from the perspective of the product’s data: from product requirements to service and maintenance: a walk along the product lifecycle phases and identification of relevant information to be managed.
• Getting familiar with common terms, methods and approaches for setting up proper Configuration Management in your project (configuration items, product structure, release, baselines, variants, alternatives, changes, deviations, concessions, conformity, certification...)
• Requirement structure, work breakdown structure, system breakdown, functional and physical configurations, production and maintenance view on product data and dependencies between these.

Configuration Management put in practice
• How do all the presented data structures fit together and complement each other in a consistent way
• Exercise based on a simple mechatronic product
• Basics of technical change management
• Basics of release and baseline management
• Exercise based on a simple mechatronic product

www.se-training.net
Additional Information

It uses structured training and exercises to explain how to tailor and apply Systems Engineering practices to the specific challenges encountered in this environment. The course is delivered by OptimaSC Independent Systems Consultancy Engineers and is designed as a 4.5 day course.

It will cover:

• The development of vehicles, understanding of requirements, architecture and the integration of sensors, communications, automotive and other systems.
• Integration methods and evaluation strategies.
• The assessment of electrical and electronic sub-systems for platform and information management systems.
• Vulnerabilities, trends and best practice for human-machine interface, computing and software issues.
• Human factors integration and user workload issues.
• Management of Systems Engineering processes across disparate disciplines.

Please see following pages for detailed course structure and timetable.

Learning Outcomes

For the individual this course will:
• Teach the application of Systems Engineering processes in a practical and pragmatic way that can be readily applied to real world problems.
• Provide tools to help manage the complexities of modern vehicle systems development.

For an organisation this course will:
• Allow organisations to implement Systems Engineering processes that are appropriate to their business needs.
• Reduce the technical risks of an organisation facing complex vehicle development.

The course will develop the principles of Systems Engineering in the context of developing and integrating complex vehicles. It focuses on the practicalities of applying Systems Engineering by using realistic case studies and real world practical examples.

On successful completion, delegates should be able to:
• Contribute to the planning of the development lifecycle, including phased test and acceptance activities.
• Understand interoperability issues for complex land platforms and understand the supportability of military systems through life in different contexts.
• Participate in stakeholder engagement and requirements engineering in support of assessing the needs for sub-systems and their integration with vehicles.
• Evaluate equipment fits in terms of technological risk, military capability, cost and crew utility.
• Critically evaluate the budget requirement for Size, Weight, Power, communication bandwidth, etc. of armoured fighting vehicles.
• Understand the integration of humans as a system and their influence on the systems performance.
• Identify suitable sensors, sensor interfaces and sensor fusion and communication techniques to improve situational awareness.
• Appreciate the need for electrical and electronic sub-systems.

Who Should Attend

• The course is suitable for anyone looking to pursue a career or advance in Systems Engineering in relation to specialist vehicles.
# COURSE STRUCTURE

<table>
<thead>
<tr>
<th>MORNING</th>
<th>AFTERNOON</th>
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<tbody>
<tr>
<td><strong>DAY 1</strong></td>
<td><strong>DAY 1</strong></td>
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<tr>
<td>Introduction to Systems Engineering: Why is SE important and what can it do for us?</td>
<td>Case analysis, scenario generation and ConOps/ConEmp/ConUse: Requirements Engineering including tools and techniques to improve their ‘quality’.</td>
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<tr>
<td>Open discussion and engagement: particular problems in the land platform space. Reach a shared understanding of the issues and move towards a common schema for SE problems.</td>
<td>Understanding the importance of knowing what the customer needs, wants, desires.</td>
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<tr>
<td>Stakeholder Management: Understanding who is important in the problem and how to manage them.</td>
<td>Tools to assess completeness, coverage and understanding.</td>
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<td>Acceptance Processes and Programme Implications: Understanding what success will look like.</td>
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| **DAY 2** | **DAY 2** |
| Context and Structure Architecture: logical and physical views and the importance of each. | Product Case Study: Understand the practical implication of what has been learned so far. Developing the architecture and interfaces of case study. |
| Modelling to support options generation and selection: Understanding how dependencies, relationships and interfaces impact the system development, and other techniques for decision support. | |
| Interfaces specification and management. A layered approach including human interfaces: Understanding how interfaces are identified, specified and managed. | |

| **DAY 3** | **DAY 3** |
| Integration using architecture and model information to optimise integration approach and support progressive assurance: understanding how things are integrated and the importance of order and sequence. | Product Case Study: Understand the practical implications of what has been learned so far. Developing the integration and V&V for the case study. |
| Verification and Validation combined to support evidence based design and product acceptance: Understand the difference between verification and validation, and the cost and implications on requirements, integration and acceptance. | |

| **DAY 4** | **DAY 4** |
| Reliability, Safety and Security: Understand how these are identified, defined, managed, incorporated, demonstrated, verified and validated. Understand the long term plan for the product or service. | Review of Product Case Study: Did it identify issues not addressed by SE? How would the specialities of S&S, ARM, Sustainability and Technology be addressed? |
| Technology management and road maps. | |

| **DAY 5** | **DAY 5** |
| Managing Systems Engineering Processes (SEMP): Information Management, Project Management, Governance and Reviews, Maturity Growth and Change Management. Understand the importance of management and that a document is not sufficient unless enforced. | Systems of Systems Issues: Discussion. Understand the context of your work as well as the context of the system. |
As systems become ever increasingly complex, their behaviour becomes proportionally more difficult to predict. Not managing this unpredictability results in projects discovering design and architectural issues late on, resulting in delayed and cancelled projects, expensive reworks and last-minute reductions in scope leading to very unsatisfied Stakeholders.

As is often the case in Systems Engineering, it is again clear that many of these design and architectural risks could have been very effectively mitigated upfront. One significant competence for these upfront mitigations is by modelling and simulating the System performance and behaviour. Many industries have now excelled by incorporating this discipline into their daily work and company processes, although there are many still seriously lacking in this discipline.

SE Training’s strategy in this category is to offer courses that can enable research and development departments to save costs, deliver on time and exceed Customer expectations!
MBSE and SysML
Introduction

Delivered by Mohammad Chami

Course Overview

This course provides the participants a combination of the fundamental and practical aspects of MBSE and SysML. The course first deals with explaining the core concepts of MBSE. Next, several practical exercises are performed to demonstrate the basics for deploying MBSE using SysML without using any specific tool. Finally, the course wraps up with a discussion of the challenges faced when developing and deploying MBSE in real-world applications and how to manage it.

Learning Outcomes

• To learn what is MBSE, modelling language, modelling method and modelling tool

• To understand SysML basic concepts

• To understand why we should use MBSE and how it can be used to manage system engineering challenges

• To learn how to start with MBSE, what to do and what not to do

Course Pre-requisites

System or software engineering knowledge. No prior training is required.

Who should attend

• All engineers, particularly systems and software engineers/architects or those who work with requirements, concept description, traceability and aim at improving how they analyze, design, and manage their systems.

• All managers, particularly those who aim at deploying MBSE to reduce design time, improve product quality, manage complex products, save cost and ensure reusability.

• Systems engineers who want to learn how to use and then go beyond systems thinking.

OTHER COURSES ON MODELLING

MBSE & SYSML INTERMEDIATE

MODELLING AND SIMULATIONS

COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
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</table>
| 1   | • MBSE Introduction and core concepts  
     • Deploying MBSE compared to traditional SE  
     • SysML introduction and relation to UML  
     • How SysML supports and enables MBSE | • SysML diagrams and elements (simplified version)  
     • SysML modeling method definition  
     • Exercise: How to use SysML with a defined method in a systems modeling tool in your organization |
| 2   | • Exercise: collaborate for creating a basic SysML model (tool independent)  
     • Exercise: MBSE case study. Analyse the benefit v.s. effort for deploying MBSE in your organization | • Advice for developing and deploying MBSE activities  
     • Lessons learned discussion, what and what not to do  
     • Conclusion, feedback, QA and evaluation |
MBSE and SysML Intermediate

Delivered by Mohammad Chami

Course Overview

This course provides a solid foundation of the fundamental and practical aspects of MBSE and SysML. Participants will learn more about how to interpret and understand SysML models, their elements and how to read their diagrams. Furthermore, the concepts of modeling method based on SysML will be explained in order to demonstrate how SysML can be customized for a particular application domain. This course also includes several interactive practical exercises, discussions and lessons learned to ensure a successful MBSE implementation with clear defined goals and aimed deliverables.

Learning Outcomes

• SysML advanced concepts including all diagrams
• To learn how to model systems’ requirements, structure, behavior and their traceability
• To learn how to customize SysML for a particular application domain
• To learn how to deploy MBSE in your organization (team setup, goals definition, collaborative modeling, tool selection...)
• To explore further topics overview: profile definition, model structure, reusability, model review, document generation, model execution, variability modeling, model based testing...
• Preparation for the OCSMP certification

Who should attend

• Systems Engineers
• Software Engineers and Architects

Course Pre-requisites

Participants are required to have attended MBSE & SysML Introduction course.

COURSE STRUCTURE

Day | Morning | Afternoon
---|---|---
1 | • Structural modeling with SysML:  
- System hierarchy and interfaces with block definition and internal definition diagrams  
- Model structure, view and viewpoints with package diagrams  
- System properties and constraints with parametric diagrams  
- Exercise: interpret and apply structure modelling on a specific example suiting your organisation | • Behavioural modeling with SysML  
- System boundary, actors and use cases with use case diagrams  
- System flow-based and interaction-based behavior with activity and sequence diagrams respectively  
- System states and transition between them with state machine diagrams  
- Exercise: interpret and apply behavioural modelling on a specific example suiting your organisation

2 | • Modeling Requirements with SysML  
- Model system requirements and their traceability  
- Modeling traceability between requirements and system model elements  
- Cross-cutting relationships between model elements  
- Exercise: interpret traceability diagrams | Other topics overview:  
- Model documentation  
- Modeling in a collaborative manner  
- Dealing with model complexity, reusability  
- Tool selection criteria, team setup and more topics

3 | • Further MBSE topics overview:  
- Model execution, variability modeling with SysML, model based testing, Safety modeling with SysML  
- Exercise: Define your SysML modeling method (with modelling guidelines, tasks, deliverables, context, traceability, views...)  
- Exercise: Customize SysML for your method needs (Profiles, stereotypes, validation rules...)?  
- Exercise: How to prepare for the OCSMP certification (Introduction and literature)?  
- Exercise: How to use the created SysML models (e.g. document generation, change analysis, knowledge exchange...)?  
- Exercise: Integrating your SysML models with other tools and models.  
- Conclusion, feedback, QA and evaluation |
Virtual Product and Solutions Development

Delivered by Thomas Meenken

Course Overview

Virtual product development is the key-success factor to reduce development time, cost and risks. However, due to its complexity the first steps to apply this methodology are cumbersome. This course provides a comprehensive overview and is a starting point to prepare you and your organization to use this powerful methodology. The course will create a basic understanding of the strengths and weaknesses of numerical modelling and simulations so that you know which problems can be solved and which cannot.

Learning Outcomes

- Understand the capabilities, application fields and limitations of numerical modelling and simulations.
- Know the different tools and methods for standard industry purposes such as System- Modeling, simple Physical Models, Multi-Body-, Multi-Physics, Finite-Element (Structure FEM and Fluid CFD) Simulation.
- Understand how these different tools and methods should be combined and integrated into the development process.
- Be able to create a holistic and strategic implementation plan into your organization.
- Be able to balance investments with expected improvements.

Who should attend

- Managers and engineers who are responsible to reduce product development time, cost and risks.
- Managers and engineers who want to include modelling and simulation into their development process.
- Simulation engineers who are interested in the bigger picture.
- Everybody in research and development who already thought that simulation might be a good idea but did not know where to start.

Additional Information

This 1 day class is a combination of lectures and workshops. During the workshops we will work on your implementation and roll-out plan. The intention is to provide the audience with an overall understanding of the topic rather than deep-dive into its complexity. This course is well suited as well for small and medium-sized businesses.

Course Structure

Session 1 (Morning)

- General Introduction
  - Managing expectations
  - Identify your starting point
- Motivation and success stories to use numerical modelling and simulation
  - Learn about the need
  - Experience the benefits
- Overview about what is numerical modelling and simulation
  - What is a model?
  - Basic principles of modelling and simulation
  - We develop and apply our own first and simple model
  - Exploring the large field of applications

Session 2 (Afternoon)

- 1st Workshop: Sketch the intended improvements for your organization using modelling and simulation
- Overview about the methods and tool landscape
  - Understand the different methodologies and their field of application
  - Know about the different tools and how they fit together (From model-based design to FEM)
  - Learn which tools to use for which problems
- 2nd Workshop: Match your desired improvements with the existing methods and tools
- Pre-requisites to apply numerical modeling and simulation successfully
  - Operational aspects regarding planning, people, time and costs
  - Implementing simulation capabilities into the development process
  - Best-Practice guidance
- 3rd Workshop: Develop an implementation and roll-out strategy for your organization
The word, complexity is used hundreds of times on a daily basis in almost all enterprises. Yet, does everyone share the same understanding of what is meant by a complex system, a complex problem, a complex organization etc.?! The answer is, not at all!

Complex problem solving is arguably the most highly required skill of our time, it was concluded at the World Economic Forum in 2016 as being the most essential competence needed for the future. Complex problem solving is applicable throughout the whole product life cycle and within all departments of an enterprise, it simply never goes away.

SE-Training strongly believes that people of all ages and backgrounds can be taught to think more holistically, to become aware of technical complex attributes and behaviours, and to learn methods and processes which can be used successfully when faced with a facet of complexity.

SE-Training has a vision to enable enterprises to take on ever increasingly complex problems and continually solve them within their budget and time constraints. To enable this vision there are more courses available in this category than any other. For enterprises to compete in today’s world and to be ready for the challenges of the future, complex problem solving needs to be a core competence embedded into every successful organisation.
Delivered by Joe Kasser

Course Overview

The course discusses thinking, systems thinking as a way of understanding a situation and the benefits of going beyond systems thinking to determine the problem and solution. The course applies systems thinking to systems engineering, provides the participants with a number of conceptual tools, looks at systems and their properties and then goes through each state of the system lifecycle discussing what systems engineers do in each state and how they do it; identifying the types of problems faced by systems engineering in each state, and the tools and methodologies available for the systems engineer to use in each state.

Learning Outcomes

- Understand the reasons for the different definitions of the term “system”, and the various viewpoints on systems engineering.
- Be able to identify the various types of problems faced by systems engineers in different States of the System Development Process (SDP).
- Be able to identify an appropriate tool or methodology to solve the problem.
- Be able to solve the problem.
- Understand the need for systems engineers with different competencies, skills and knowledge in different parts of the SDP.
- Understand that there isn’t always a single “right” solution to a problem.
- Have improved systems and critical thinking abilities. Be better than average systems engineers for their level of experience.

Topics Covered

Part 1 Basic principles
1. Pure systems engineering
2. Applied systems engineering
3. An introduction to systems and the System Lifecycle (SLC)

Part 2 What happens in each state of the SLC
1. The Needs Identification State
2. The System Requirements State: 1 Requirements
3. The System Requirements State: 2 Realization planning
4. The System Design State
5. The Subsystem Realization States
6. The System Integration and System Test States
7. The Operations and Maintenance (O&M) States
8. The Disposal State

Part 3 Summarizes and closes the module
1. Summary and closure

Who should attend

- Problem-solvers faced with complex problems.
- Engineers and engineering managers.
- Systems engineers who want to improve their systems engineering skills.

“Joe Kasser’s course was a huge help to acquire the full picture.”

Eugenio Forzano, Industry and Transformation Specialist
# COURSE STRUCTURE

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<td>• Systems engineering as perceived from the perspectives perimeter</td>
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<td>• The nine Holistic Thinking Perspectives</td>
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<td>• The scientific perspective</td>
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<td>• Useful Frameworks for systems engineering</td>
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<td>Session 2: Applied systems engineering (an introduction)</td>
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<td>• The background and context for systems engineering</td>
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<td>• The Nine-System Model</td>
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<td>2</td>
<td>Session 3: An introduction to systems and the system lifecycle (SLC)</td>
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<td>• Systems</td>
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<td>• Nature of systems</td>
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<td>• Hierarchies of systems</td>
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<td>• Functional view of a system</td>
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<td>• Template for a system</td>
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<td>• Creating systems</td>
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<td>Session 4: The Needs Identification State</td>
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<td></td>
<td>• The three parts of the Needs Identification State</td>
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<td>• Hard and soft systems</td>
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<td>• Feasibility studies</td>
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<td>• The Concept of Operations (CONOPS)</td>
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<td>• The difference between solution selection criteria and requirements</td>
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<td>• Acquisition strategy decisions</td>
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<td>• Systems engineering in the Needs Identification State using the Nine-System Model</td>
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<td>Session 5: The Requirements State: 1 requirements</td>
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<td>• Specifications</td>
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<td>• Requirements analysis</td>
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<td>• Grammar of the requirement statement</td>
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<td>• Attributes of requirements</td>
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<td>• Types of requirements</td>
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<td>• Uses of requirements in the system lifecycle</td>
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<td>• Requirements management</td>
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<td>• Sources of requirements, acceptance criteria</td>
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<td>• The importance of well-written requirements</td>
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<td>• Some of the consequences of poorly written requirement</td>
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<td>Session 6: The Requirements State: 2 Realization planning</td>
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<td>• Project plans</td>
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<td>• Milestone reviews</td>
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<td>• Requirements drive the work</td>
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<td>• Contents of project plans</td>
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<td>• Planning tools</td>
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<td>• Systems approach to project management</td>
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<td>• SEMP, TEMP and SHMEMP</td>
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<td>• Configuration management</td>
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<td>Session 7: The System Design State</td>
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<td>• An awareness of the factors involved in functional and physical partitioning of a system.</td>
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<td>• Analysis for determination of feasibility.</td>
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<td>• Factors to consider and monitor in the design for performance, cost, reliability, integration, test, maintainability and safety.</td>
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<td>• Design optimization.</td>
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<td>• Problem solving across subsystem boundaries.</td>
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<td>• Luz Case study</td>
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<td>Session 8: The Subsystem Realization States</td>
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<td>• An awareness of the factors involved in functional and physical partitioning of a system.</td>
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<td>• Luz Case study</td>
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<td>Session 9: The System Integration and System Test States</td>
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<td>• Awareness of the factors involved in integration of components into a system.</td>
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<td>• Integration of a system into its adjacent systems.</td>
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<td>• Design for integration.</td>
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<td>• Problem solving across subsystem boundaries.</td>
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<td>Session 10: The Operations and Maintenance States</td>
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<td></td>
<td>• The role of systems engineers in the handover transient, operations and maintenance phases of the system lifecycle.</td>
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<td>• An awareness of the factors involved in managing changes and upgrades, teams, and control of phased sequential system releases.</td>
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<td>• Review of iteration, recursiveness and phased builds.</td>
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<td>• Change.</td>
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<td>Session 11: The Disposal State</td>
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<td>Session 12: Summary and Wrap Up</td>
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<td>• Recap of the module design</td>
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<td>• Summary of sessions</td>
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Systemic and Systematic Thinking and Beyond

Delivered by Joe Kasser

Course Overview

Holistic thinking is a combination of analysis, systems thinking and critical thinking. After an introduction to systems thinking and critical thinking, participants will learn how to apply holistic thinking in a systemic and systematic manner to deal with structured and unstructured problems.

Learning Outcomes

• The ability to deal with open ended problems with no unique solutions.
• Improved problem solving, systems and critical thinking abilities.
• The ability to go beyond systems thinking in the analysis of a problem and determination of a solution.

Who should attend

• Managers and leading engineers facing complicated problems.
• Managers wanting to improve their thinking and communication skills.
• Engineers looking for promotion into management positions.
• Systems engineers who want to learn how to use and then go beyond systems thinking.

OTHER COURSES BY JOE KASSER

A SYSTEMS APPROACH TO PROJECT MANAGEMENT

SYSTEMS THINKING AND BEYOND

COURSE STRUCTURE

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www.se-training.net
Problem Solving for Business
Delivered by Mike Johnson

Course Overview

In the business domain complexity is caused by many factors and constraints, such as sudden changes to the market, competitive challenges, limited resources and a high uncertainty on what the customers actually need.

Solving complex problems is one of the most urgently required skills in our current time. As the world around us becomes more advanced, the markets become more and more complex to understand, design for and successfully implement solutions in. This can be seen across multiple industries and is causing significant front line issues resulting in companies losing their competitive edge overnight.

Learning Outcomes

- To understand and be able to apply a systematic methodological process for complex problem solving in a business setting
- To experience using numerous techniques for finding and developing high value solutions, eg. the Problem 3-6-5 method.
- To experience using numerous techniques for evaluating the value of technical solutions, eg. Extended trade-off.
- To experience leading the technical workshop group for one session.

Who Should Attend

- Product owner
- Business leaders
- Marketing
- Sales Roles

Course Structure

In this One-Day MasterClass, a systematic methodological process for applying to complex business problem solving shall be taught. Each stage of the process shall be expanded to include real-world examples in addition to various approaches for tailoring and applying the process. The course includes a moderated group workshop where a modern day example shall be worked through.

Throughout the day, the following topics will be covered:

- Scope of business decision making
- Overview of decision making scenarios
- Generic problem solving method
- Application of generic problem solving method (Workshop)
- Reflection on Attendees’ application in their unique environments

OTHER ONE-DAY MASTERCLASSES

- TECHNICAL PROBLEM-SOLVING
- CONFIGURATION MANAGEMENT
- COMPLEXITY IN PROJECT & PROGRAMME MANAGEMENT

www.se-training.net
Additional Information

The importance of a well-defined concept including product/service conception, business design and clear determination of the customer needs is fundamental before the development starts. The later misconceptions are discovered, the more costly it gets and there is a lot of wasted work, money and time.

Design Thinking and Systems Engineering are both problem-solving methods that try to cope with the increasing complexity. Both approaches are, at first glance, completely different. But on a closer look, they become more and more complementary and share many thoughts. Combining both approaches and switching the thinking mode is essential when dealing with ambiguity.

The course is very practice-oriented and hands-on. The participants will spend more than half of the time practicing, e.g. meeting the user and practicing need-finding, creating new ideas, building prototypes and testing with the user.

Who should attend

- Managers and engineers who would like to enrich their problem solving competences with user-centric and agile approaches
- Managers who are looking for ways to create radical innovations
- Managers who would drive the digital transformation in their area
- Anyone who is responsible to create new products, services, business models and would like to integrate design oriented methods

Learning Outcomes

- Understand the basics of Design Thinking and Lean Innovation
- Know how to combine Design Thinking and Systems Thinking and when to switch thinking modes
- Apply tools to determine the customer needs and carry out need-finding
- Build and test different types of low-resolution prototypes (e.g. Critical Experience or Dark Horse prototype) with the user and improve your understanding of the situation
- Use the Lean Canvas to summarize the findings and to improve it iteratively
- Practice Design Thinking and Lean Innovation on a practical challenge during the three days.
- Reflect and transfer the learnings into your daily business and own projects
- Define how to Implement Design Thinking/Lean Innovation in your environment
**COURSE STRUCTURE**

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<td>• Lean Start-up and Lean Innovation</td>
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<td>• Design Thinking in a Nutshell (“Try/Run”)</td>
<td>• Persona/User profile</td>
<td>• Joint Problem Solving approach (How to combine System Thinking and Design thinking)</td>
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<td>• Reflection</td>
<td>• Human Centered Ideation</td>
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<td>• Basic Design Thinking and Human-Centricity</td>
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<td>• Design Challenge</td>
<td>• Build a Critical Experience Prototype</td>
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<td>• Problem analysis</td>
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<td>• Reflection</td>
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<tr>
<td>• Customer Journey</td>
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</tbody>
</table>

**COMPLEX PROBLEM SOLVING**

![Complex Problem Solving Diagram]

- **Intuition-Emotion**
  - **Empathy**
  - **Define POV**
  - **Ideate**
  - **Prototype & Test**

- **Rationality-Logic**
  - **Situation Analysis**
  - **Define Objectives**
  - **Solutions**
  - **Evaluation**

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**Day 1**
- Introduction & Overview
- Design Thinking in a Nutshell (“Try/Run”)
- Reflection
- Basic Design Thinking and Human-Centricity
- Design Challenge
- Problem analysis
- Customer Journey

**Day 2**
- Need-finding & Synthesis
- Persona/User profile
- Human Centered Ideation
- Prototyping and different Prototyping variants
- Build a Critical Experience Prototype

**Day 3**
- Lean Start-up and Lean Innovation
- Joint Problem Solving approach (How to combine System Thinking and Design thinking)
- Lean Canvas
- Business Design and Business Analogies
- Risk analysis and defining experiment
- Reflection

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www.se-training.net
Design Thinking & Lean Innovation Advanced

Delivered by Patrick Link

Course Overview

Design Thinking and Lean Innovation are easy to understand concepts, however with the practice more questions arise. In this advanced workshop we dig deeper and learn additional tools and methods (like business ecosystem design), reflect the practical experiences and challenges of the participants and how to overcome them.

Additional Information

In addition to combining Design Thinking and Systems Thinking, we learn how to make a deep dive into designing a business ecosystem, creating stakeholder maps and have a look into the hybrid model (combining Design Thinking and Big Data Analytics).

The workshop will also focus in the challenge of implementing Design Thinking in your organisation.

Learning Outcomes

• Discuss challenges that occur when facilitating groups and managing design thinking / Lean Innovation projects and to define ways to overcome those.

• Solve practical challenges

• Understand the challenges in implementing Design Thinking in your organisation

• Learn how to design a business ecosystem using a Minimum Viable Ecosystem (MVE)-approach

• Create a stakeholder map of your organisation and define a strategy “how to take it home”

• Combine Big Data Analytics and Design Thinking to a hybrid management model

• What is the mind-set? And how to create this mindset?

• Reflect and transfer the learnings into your daily business and own projects

Course Pre-Requisites

The participants should have some practical experience with Design Thinking and/or Lean Start-up or Lean Innovation and bring their own challenges into the course. During the course we reflect on the experiences of the user and elaborate together possible solutions to solve those challenges.

The Design Thinking and Lean Innovation Introduction course would be an ideal pre-cursor to this programme.

Who should attend

• Managers and engineers who would like to enrich their problem solving competences with user-centric and agile approaches

• Managers who are looking for ways to create radical innovations

• Managers who would drive the digital transformation in their area

• Anyone who is responsible for creating new products, services, business models and would like to integrate design oriented methods

OTHER COURSES ON PROBLEM-SOLVING

PROBLEM-SOLVING FOR BUSINESS

www.se-training.net
COURSE STRUCTURE

Day 1

• Collect your challenges in implementing Design Thinking and Lean Innovation
• Business Ecosystem Design (practical workshop)
• Input: Hybrid Model (Combination of Big Data Analytics and Design Thinking)

Day 2

• Practical Work on your challenges
• Discuss particular topics of interest, e.g. facilitation, interdisciplinary teams composition, room setup, mindset, etc.
• Take it Home Challenge: Transfer the learnings into daily business
• Reflection

BUSINESS ECO-SYSTEM DESIGN

by Patrick Link
Technical Problem-Solving
Delivered by Mike Johnson

Course Overview
Solving complex problems is one of the most urgently required skills in our current time. As technologies become more advanced, the possible solutions created by them become more and more complex to understand, design for and successfully implement. This can be seen across multiple industries and is causing significant front line issues to reliability, maintenance, project cost, product performance and overall schedules.

Learning Outcomes
• To understand and be able to apply a Systematic methodological process for technical complex problem solving
• Experience using numerous techniques for finding and developing high value solutions, eg Triz.
• Experience using numerous techniques for evaluating the value of technical solutions, eg Extended trade-off.
• Experience leading the technical workshop group for one session.

Who Should Attend
• Systems Engineers
• Technical Leaders
• Project Managers
• Requirements Engineers
• System Architects
• Development Engineers
• Verification and Validation Engineers
• Quality Engineers

Course Structure
In this One-Day Masterclass, a systematic methodological process for applying to technical complex problem solving shall be taught. Each stage of the process shall be expanded to include real-world examples in addition to various approaches for tailoring and applying the process. The course includes a moderated group workshop where a modern day example shall be worked through.

Throughout the day, the following topics will be covered:
• Scope of technical decision making
• Overview of decision making scenarios
• Generic problem solving method
• Application of generic problem solving method (Workshop)
• Reflection on Attendees’ application in their unique environments

OTHER ONE-DAY MASTERCLASSES

www.se-training.net
MEET THE TEAM

We are an international team of experts specialising in cross-functional disciplines such as Systems Engineering and Project Management, working across multiple industries and academia.

Dave Snowden
Presenter

Founder and chief scientific officer of Cognitive Edge. His work is international in nature and covers government and industry looking at complex issues relating to strategy, organisational decision making and decision making. He has pioneered a science based approach to organisations drawing on anthropology, neuroscience and complex adaptive systems theory. He is a popular and passionate keynote speaker on a range of subjects, and is well known for his pragmatic cynicism and iconoclastic style.

He holds visiting Chairs at the Universities of Pretoria and Hong Kong Polytechnic University as well as a visiting fellowship at the University of Warwick. He is a senior fellow at the Institute of Defence and Strategic Studies at Nanyang University and the Civil Service College in Singapore. His paper with Boone on Leadership was the cover article for the Harvard Business Review in November 2007 and also won the Academy of Management award for the best practitioner paper in the same year.

He has previously won a special award from the Academy for originality in his work on knowledge management. He is an editorial board member of several academic and practitioner journals in the field of knowledge management and is an Editor in Chief of E.CO. In 2006 he was Director of the EPSRC (UK) research programme on emergence and in 2007 was appointed to an NSF (US) review panel on complexity science research.

He previously worked for IBM where he was a Director of the Institution for Knowledge Management and founded the Cynefin Centre for Organisational Complexity; during that period he was selected by IBM as one of six “on-demand” thinkers for a world wide advertising campaign. Prior to that he worked in a range of strategic and management roles in the service sector.

Mohammad Chami
Presenter

Mohammad Chami is a Model-Based Systems Engineering expert with a solid academic and industrial experience in modeling languages, processes, developing and deploying methods for system modeling and customizing its tools.

Currently, Mohammad is employed as a Modeling Expert at Bombardier Transportation, with a primary focus on the development and deployment of MBSE on operational projects across all BT divisions, leading the MBSE key users’ Network and frequently giving MBSE trainings.

Other qualifications:

- Mohammad holds two master’s degrees in Electronics and Mechatronics, and the OMG Certified Systems Modeling Professional Certificate (OCSMP)

Bert Taeymans
Presenter

Bert Taeymans is employed at the business unit Solution Integration/Workflow & IT Solutions of Roche Diagnostics International.

Bert Taeymans leads the Systems Engineering team designing and implementing an innovative solution for automating extra-large laboratories.

Bert started his career in the domain of transportation and supply chain management. His founded spin-off Orinoco was specialized in developing advanced scheduling and optimization solutions in transportation and supply chain management. Bert was one of the pioneers of applying discrete event simulation for evaluating maritime port operations and new infrastructure investment scenarios. He has the Bombardier Recognition of appointment as “Engineering Management, Processes, Methods and Tools” Expert
MEET THE TEAM

Bert Taeymans
Presenter
Successfully applied his methodology to railroad traffic and multimodal transportation scenarios as well.

After acquisition of Orinoco by KPMG Consulting, Bert Taeymans has led the Advanced Planning and Scheduling of the Supply Chain Management Practice.

After KPMG Consulting, he worked as an independent Enterprise/Solutions Architect in the energy industry, where he has re-engineered the entire Engineering-Procurement and Construction process of one of the major gas transmission, terminals and storage operators in Europe.

Bert has a M. Sc. in Computer Science (Artificial Intelligence) and M. Sc. Engineering.

Jim Mateer
Presenter
Jim Mateer BSc, MSc, MIET, MRAeS has a background in engineering within the hazardous fast jet and weapons environment. For the last twelve years, however, he has specialised in safety engineering and management in a number of diverse domains including aviation, weapons, communications, autonomy, protective clothing, hydrogen fuel cells, armoured vehicles and software. During his time with a large electronics manufacturer Jim specialised in product safety, compliance to EU legislation and CE Marking. His study at the University of York on the Critical Systems Safety Engineering course, culminated with him presenting his research to the assessment of Safety Related Information Systems. Recently, Jim has provided Independent Safety Auditing services for the UK Ministry of Defence’s suite of future armoured fighting vehicles and been supporting a global aviation manufacturer in improving its management of airworthiness. For QineitQ Jim developed two system safety courses dealing with safety risk identification and assessment and safety management.

Shaun West
Presenter
Shaun West has worked for over 18 years in the aftermarket for GE Energy Services (Italy), Sulzer Rotating Equipment Services (Switzerland) and RWE (UK) before moving into his academic role in the Hochschule Luzern. In each of these roles pricing has always been an important aspect, from estimating value creation, to M&A transactions and service contracts. Today, in his academic role, he brings together his industrial experience with academic rigour to investigate and disseminate key issues associated with product-services systems, primarily in an industrial setting.

Niels Malotaux
Presenter
Niels Malotaux is an independent Project Coach and expert in optimizing project performance. He has some 40 years of experience in designing electronic and software systems at Delft University, in the Dutch Army and at Philips Electronics. Then another 20 years leading a systems design company. Since 1998 he has devoted his expertise to helping projects and organizations to deliver Quality On Time: delivering what the customer needs, when they need it, to enable customer success. To this effect, Niels developed an approach for effectively teaching Evolutionary Project Management (Evo) Methods, Requirements Engineering, Review and inspection techniques, as well as Reliable Embedded Systems Design and how to achieve Zero Defects for the customer. Since 2001, he has taught and coached well over 400 projects in 40+ organizations in the Netherlands, Belgium, China, Germany, Ireland, India, Israel, Japan, Poland, Romania, Serbia, South Africa, the UK and the US, which has led to a wealth of experience in which approaches work better and which work less well in practice.

Günter Zepf
Presenter
Since 2009, he has been a Lecturer for Product Innovation at the Lucerne University of Applied Science and Art.

He teaches on both the Bachelor and Continuing Education programmes with a focus on entrepreneurialism and coaching.

Prior to joining the university, he was
MEET THE TEAM

Richard Maguire
Presenter

Richard Maguire BEng MSc CEng FI MechE MSaRS MBCS has vast experience in safety engineering across a number of diverse technologies including, aviation, weapons, communication systems, vehicles, unmanned air systems, sub-sea platforms and software. Notably, Richard worked on assuring flight control software for UAS, as well as post-accident and predictive stress analysis and computational fluid dynamics modelling for oil, gas and fire protection pipework systems. As a renowned specialist, he plays a key role in developing UK safety and software standards and has published a vast array of diverse papers. Additionally, he is the author of the popular book “Safety Cases and Safety Reports – Meaning, Motivation and Management”. Due to his standing within the safety community, Richard has taught at a number of institutions, including: The University of York - Safety Critical Systems Master’s Degree; Empire Test Pilot School - Aviation System Safety; UK Ministry of Aviation System Safety; UK Ministry of Defence - Acquisition System Safety; and the Bundeswehr University Munich Modelling Human Reliability.

Dr. Joseph Kasser
Presenter

Joseph Kasser has been a practicing systems engineer for almost 50 years and an academic for 20 years. He is a Fellow of the Institution of Engineering and Technology (IET), a Fellow of the Institution of Engineers (Singapore), the author of “Perceptions of Systems Engineering”, “Holistic Thinking: creating innovative solutions to complex problems”, “A Framework for Understanding Systems Engineering” and “Applying Total Quality Management to Systems Engineering” and many INCOSE symposia and other conference and journal papers. He is a recipient of NASA’s Manned Space Flight Awareness Award (Silver Snoopy) for quality and technical excellence for performing and directing systems engineering and other awards.

He holds a Doctor of Science in Engineering Management from The George Washington University.

He is a Certified Manager, a Chartered Engineer in both the UK and Singapore and holds a Certified Membership of the Association for Learning Technology.

He has performed and directed systems engineering in the USA, Israel and Australia. He gave up his positions as a Deputy Director and DSTO Associate Research Professor at the Systems Engineering and Evaluation Centre at the University of South Australia in early 2007 to move to the UK to develop the world’s first immersion course in systems engineering as a Leverhulme Visiting Professor at Cranfield University.

He spent 2008-2016 as a Visiting Associate Professor at the National University of Singapore where he taught and researched the nature of systems engineering, systems thinking and how to improve the effectiveness of teaching and learning in graduate and continuing education. He is currently based in Adelaide, Australia.

His many awards include:

- National University of Singapore, 2008-2009 Division of Engineering and Technology Management, Faculty of Engineering Innovative Teaching Award for use of magic in class to enrich the student experience.
- Employee of the Year, SEEC, 2000.
- Distance Education Fellow, University System of Maryland, 1998-2000.
- Distinguished Service Award, Institute of Certified Professional Managers (ICPM), 1993.
- NASSA Goddard Space Flight Center Community Service Award, 1990.
- Letters of commendation and certificates of appreciation from employers and satisfied customers including the:
  - American Radio Relay League (ARRL).
  - American Society for Quality (ASQ).
  - Association for Quality and Participation (AQP).
  - Communications SatelliteCorporation (Comsat).
  - Computer Sciences Corporation
MEET THE TEAM

Jürg Meierhofer
Presenter
Since 2016, he has been employed full time at ZHAW as a lecturer, researcher, and consultant for data product design. He has a passion for applying service design thinking linked to data science to attack these Industry 4.0 issues to help gain a better understanding of the outcomes that are important for their commercialisation.

Prior to joining ZHAW, he was the head of department for “Innovation Projects” at la Mobilière / die Mobiliar, where he developed a structured service innovation process, introduced rapid service prototyping and developed a number of new services. Before joining la Mobilière, he was leading departments for service innovation and optimization at Swisscom with a key focus on lean in service and customer experience design. He holds a PhD from ETH Zurich and an MBA from University of Fribourg.

Petra Müller
Presenter
Since 2013 Petra has been a lecturer for Information Design teaching in the Bachelor Programme and Continuing Education at the Lucerne University of Applied Sciences and Arts School of Engineering and Architecture. Her research interests are based around service design. She is currently also studying for a PhD in Service Design.

Prior to moving to Lucerne, she was teaching Information Design at the University of Applied Science in Dresden as well as in Darmstadt. She also has her own consulting business. She has a Masters Degree in Design, an MBA and is widely published.

Patrick Link
Presenter
Since 2009 Patrick has been a Professor for Product Innovation in the study program “Industrial Engineering|Innovation” at the Lucerne University of Applied Sciences and Arts (LUASA) School of Engineering and Architecture.

He studied Mechanical Engineering and got his doctorate in the field of innovation management at the BWiMETH Zurich. After that, he worked for Siemens in various positions. His research and teaching interest are in the field of agile product management, Design Thinking and Entrepreneurship and the combination of these approaches, for example Design Thinking, Systems Thinking and Data Analytics. Together with Larry Leifer from Stanford University and Michael Lewrick from Swisscom, he is the Co-editor of the book “Das Design Thinking Playbook”.

Thomas Meenken
Presenter
Thomas is a passionate driver of Systems Engineering and more specifically numerical simulation to promote complex systems development to its next level.

He has worked in various roles as Systems Engineer, project- and department-leader, in several industries, including semiconductor, optics, defense and health-care. His international projects involved multi-disciplinary teams often consisting of Mechanical, Electrical, Technology, Software and Optical Engineers.

After writing his first finite-difference simulation-code during his Master-Thesis in Canada, he constantly applied numerical simulation and modeling to improve product and solution development during his further career.

As the founder and chairman of the Roche Global Systems Engineering Expert Forum, Thomas set the foundation of a holistic implementation of Systems Engineering in Roche’s Research and Development (R&D)。“
MEET THE TEAM

Nick Eaton
Presenter

Nick Eaton holds a Masters in Sound and Vibration from Southampton ISVR, an Engineering Bachelors from Surrey University and is a Chartered Engineer with the UK IMechE. He previously worked at GKN-Westland and RUAG Space between 1990 and 2017, in Acoustics Analysis, Technology and Systems Engineer roles. He is now leader of a consulting company Space Acoustics GmbH, offering advanced analysis, design and validation services to aerospace, and general industry. Nick is an internationally recognised expert in acoustics and systems engineering.

Dr. Michael Lewrick
Presenter

Michael Lewrick, PhD, MBA has had different roles over the last few years. He was responsible for strategic growth, acted as Chief Innovation Officer and laid the foundation for numerous growth initiatives in sectors that are in the digital transformation. He is a motivational international speaker and teaches Design Thinking as a visiting professor at various universities. With his help, a number of international companies have developed and commercialized radical innovations. In his latest international bestseller, “The Design Thinking Playbook”, he postulated with his colleagues from Stanford University a new mindset of converging approaches of design thinking in digitization.

In addition, he is specialized on the Design of Business Ecosystems for Blockchain applications in the Crypto-Valley, Switzerland.

Dr. Amihud Hari
Presenter

Dr. Amihud Hari now heads Design Speedovation Inc. He is a facilitator, consultant and instructor of New Product Development, System Engineering and Engineering Design methods. His experience includes many applications of Engineering Design Methodologies. He also teaches Engineering Design and T&E at the Technion, Haifa, Israel and was an Adjunct Associate Professor at the System Engineering and Evaluation Centre (SEEC) in the University of South Australia.

Dr. Hari has 20 years of experience as an operational manager in manufacturing, research and development, and procurement, for both government and private sector industries.

Dr. Hari has published more than 40 papers and book chapters on engineering design and quality methods, and he is a co-editor of the Quality Language Book. He holds a B.Sc. in Industrial Engineering, a M.Sc. in Quality Assurance and Reliability, and a Ph.D. in Engineering Design, from the Technion, Haifa, Israel.

Piet Belgraver
Presenter

Piet Belgraver started his career as electronic development engineer for several engineering companies in the Netherlands. He continued extending his technical expertise in the high volume consumer electronics industry as a senior design engineer when he moved to Denmark. During this time, he took over the role of hardware project leader for several known Nokia mobile phones. In his role his focus was to coordinate the local and global projects teams to achieve on-time delivery in factories world-wide.

After six years working for Nokia, he moved to Switzerland to work in the Aerospace industry at RUAG Space. In 2016 he moved to Thales Alenia Space when part of RUAG Space was sold
to Thales Alenia Space. He currently has the position of senior project manager for several space projects at Thales Alenia Space.

He is certified (IPMA) senior project manager with more than 15 years of experience in technical project management ranging from high volume consumer electronics to high quality Aerospace industry.

Jim Siler
Presenter

Jim Siler specialized in building plants for the Power, Energy, Waste, Oil & Gas industries. His earlier career with GE and then ABB were focused on international projects in every corner of the world.

His strength is an ability to see differences between reflexive activities and behaviors that impede progress or expose organizations to risks.

Today he lectures, consults and mentors on leadership, change process and project execution.

Dr. Seb Klabes
Presenter and Co-Founder

Dr. Sebastian Klabes has authored and reviewed numerous publications and likes to implement systems engineering principles.

After working at the Institute of Transport Science of RWTH Aachen as research associate, he worked at the German Aerospace Centre as Project Officer and as Project Systems Engineer at Bombardier.

Currently, Sebastian is heading the RAMS department at Siemens’ Mobility division. He is actively involved in the committee of the Swiss Society of Systems Engineering, is a certified Systems engineering professional and is giving systems engineering training at Siemens.

Sebastian enjoys approaching organisational and technical challenges with a ‘rock solid’ systems thinking approach.

Mike Johnson
Presenter and Co-Founder

Mike has worked in leading challenging product development roles predominantly in the Space and Defence Industries since completing his Masters degree in Photonics and Optoelectronic devices at the University of St Andrews, UK.

He has worked predominantly in the roles of Systems Engineer, leading technical developments involving inter-disciplinary teams often consisting of Mechanical, Electrical, Technology, Software and Optical Engineers. He worked at RUAG Space, Zürich for five years. During this period he moved into management, leading the Systems Engineering group in the product unit Optoelectronics and Instruments. In addition, he gave Systems Engineering training courses to the employees across the whole company, training circa 100 Engineers from a beginner’s to advanced level.

Having moved to Roche Diagnostics International to lead the Systems Engineering team in Rotkreuz, Switzerland, he is now passionately applying his experience and knowledge of Systems Engineering to the Healthcare industry.

He is passionate about product development and especially the application of Systems Engineering. He is one of the founders of the Swiss Society of Systems Engineering (SSSE) and regularly attends Swiss based IET and INCOSE lectures/seminars. He is the organiser of SWISSED, Switzerland’s annual conference on Systems Engineering. In addition, he is the co-founder of SE-Training GmbH, specialising in high quality delivery of Systems Engineering training courses in Switzerland.
TESTIMONIALS

SE FOR SPECIALIST VEHICLES - ADVANCED

“Very competent, comprehensive and professional course. The trainer had a broad knowledge with practical examples and experiences from many different fields.”

SE FOUNDATIONS

“The Workshop is one of the best seen in many trainings (well prepared, enough time/attention given, logical link between exercises), an asset of the training!!!”

DESIGN THINKING AND LEAN INNOVATION

“Presentation of the course was very dynamic and interactive... It is clear that the trainers are masters of the methods.”
GETTING TO ZÜRICH IS EASY

GETTING TO ZÜRICH IS EASY

ZÜRICH

STOCKHOLM

COPENHAGEN

HAMBURG

PARIS

ROME

LONDON

MADRID

1 hr 40 min
2 hr 10 min
1 hr 35 min
2 hr 25 min
1 hr 25 min
1 hr 10 min
1 hr 35 min
1 hr 35 min

GOT

FLIGHT MAP
# COURSE APPLICABILITY

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<th>Development &amp; Verification Engineer</th>
<th>Project Manager</th>
<th>Safety/Product Risk Engineer</th>
<th>R&amp;D Management</th>
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<td>SE Foundations</td>
<td>Seb Klabes and Mike Johnson</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Systematic Methodology for Solving Complex Problems</td>
<td>Joe Kasser</td>
<td>✔</td>
<td>✔</td>
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<td>Quality on Time</td>
<td>Niels Malotaux</td>
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<td>Improving the Result of Reviews and Inspections</td>
<td>Niels Malotaux</td>
<td>✔</td>
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<td>Product Development</td>
<td>Amihud Hari</td>
<td>✔</td>
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<td>Systems Approach to Project Management</td>
<td>Joe Kasser</td>
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<td>Systems Thinking and Beyond</td>
<td>Joe Kasser</td>
<td>✔</td>
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<tr>
<td>MBSE and SysML Introduction</td>
<td>Mohammad Chami</td>
<td>✔</td>
<td>✔</td>
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<td>Fundamentals of System and Product Safety</td>
<td>Jim Mateer &amp; Richard Maguire</td>
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<td>MBSE and SysML Intermediate</td>
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<td>Servitization - Introduction</td>
<td>Shaun West</td>
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<tr>
<td>Cradle-to-Grave Life Cycle Analysis</td>
<td>Shaun West</td>
<td>✔</td>
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<tr>
<td>Customer Journey Mapping</td>
<td>Shaun West</td>
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# COURSE APPLICABILITY

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<th>COURSES</th>
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<td></td>
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<td>Systems Engineer</td>
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<tr>
<td>SE Management</td>
<td>Mike Johnson</td>
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<td>Complexity in Project and Programme Management</td>
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<td>Design Thinking and Lean Innovation Introduction</td>
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<td>COTS (Commercially Off-the-Shelf) Based Systems Engineering</td>
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