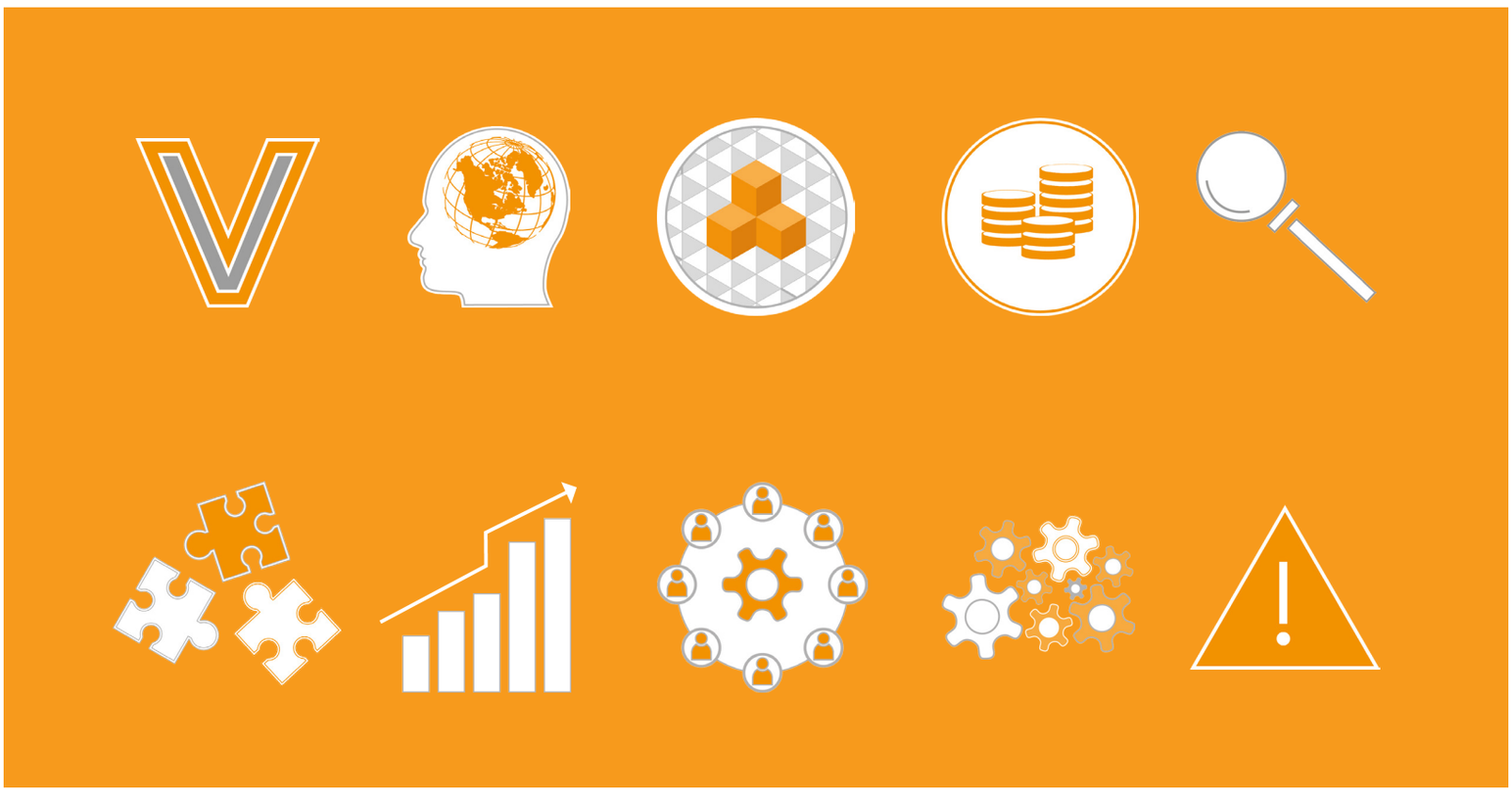
SE- Training Courses 2017



SE TRAINING

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Quality on Time

NIELS MALOTAUX

Niels Malotaux is an independent Project Coach and expert in optimizing project performance. He has some 40 year experience in designing electronic and software systems, at Delft University, in the Dutch Army, at Philips Electronics and 20 years leading a systems design company. Since 1998 he devotes his expertise to helping projects and organizations to deliver Quality On Time: delivering what the customer needs, when he needs it, to enable customer success.

Course Overview

We will study and exercise techniques how to continuously improve our effectiveness and efficiency, how to predict what we will have done when and taking the consequence, 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 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

Who should attend

This course is intended for Systems Engineers, (Project) Managers, Architects, Developers, Product Owners, Scrum Masters, and QA people who find it important to deliver Quality On Time: the right results at the right time, no excuses needed. Management because they're *responsible* for the result. All others because they *determine* the result.

COURSE STRUCTURE

Day	Morning	Afternoon
1	Is there a problem? Importance of time. Goal of a project. Estimation exercise. Human behavior in projects.	Defining quality. How to teach Zero Defects to software people. Project Life Cycles. Evolutionary and Lean principles. Homework preparation.
2	Evolutionary Planning. TaskCycle and TimeLine planning. Exercise.	Business Case, Stakeholders, Real Requirements. How to select the right solution. Exercise.

PREPARATION

In preparation for the course, please consider and note the following:

- The Goal of your current work or project
- The Definition of Success
- Who is the most important stakeholder of your project and what is their primary requirement?
- How much value improvement does this stakeholder expect (3 or 7?)
- Any deadlines? (No deadlines: it will take longer)
- What do you/your team expect to achieve in the next 10 weeks? Is it attainable? How do you make it attainable?
- What do you/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.

If you come out of the course with any change in what you wrote down, this will allow you to work more on more important things, and less on less important things. Better focus on what really is important immediately saves time.

The time you spent coming to this course can be regained quickly by applying the techniques you can learn. This may convince your boss to allow you to attend this course. Perhaps he'll even come with you.

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SE Foundations

SEB KLABES

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

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 trainings at Siemens.

MIKE JOHNSON

Mike has worked in 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 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.

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 and covering detailed use cases.

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

This workshop is intended for Requirements Engineers, Systems Engineers, Project Managers, Verification Engineers, Architects, Development Engineers and Product Owners."

COURSE STRUCTURE

Day 1	Day 2	Day 3
Introduction to Systems Engineering Systems Lifecycles, Systems Thinking, Agile SE Requirements Engineering Workshop - topics from the day	Risk & Decision Engineering Functional Analysis Design Implementation Workshop - topics from the day	Verification and Validation, Critical Analysis of Case Studies Systems Engineering Documentation Workshop - topics from the day Test and Feedback

ADDITIONAL NOTES

Each of the three days are ended with a reflective session at 5pm, with an open end time depending on the discussion. On the second day there will be an evening meal at 6:30 where course participants and leaders can enjoy social and networking opportunities.

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Product Development

AMIHUD HARI

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.

Course Overview

A good definition and conceptual design, that take place at the very early stages of the product development, are known as major keys to success of new products.

A systematic, step by step design method is proposed. Our method integrates, modifies and customizes 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, 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 the tools of the new product development method. The participants will be able to improve their ability to initiate and to define new needs, they will have learnt methods and tools for engineering design of new, high quality and competitive products and they will have learnt 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

Day	Morning	Afternoon
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

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A Systemic and Systematic Methodology for Solving Complex Problems

JOSEPH KASSER

Dr. Joseph Kasser was a practising systems engineer and manager for 30 years before joining academia. 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 many other awards and commendations. He is an INCOSE Fellow, holds a Doctor of Science in Engineering Management from The George Washington University, and is both a Chartered Engineer and a Certified Manager. He is currently a Visiting Associate Professor at the National University of Singapore. His previous academic positions include being a Leverhulme Visiting Professor at Cranfield University, England and the Deputy Director and an Associate Research Professor at the Systems Engineering and Evaluation Centre in the University of South Australia.

Course Overview

This course focuses on systems engineering as a systemic and systematic methodology for solving complex problems. 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.

Who should attend

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

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

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A Systemic and Systematic Methodology for Solving Complex Problems

COURSE STRUCTURE

Day	Morning	Afternoon
1	Session 1: Pure systems engineering • Systems engineering as perceived from the perspectives perimeter • The nine Holistic Thinking Perspectives • The scientific perspective • Useful Frameworks for systems engineering	Session 2: Applied systems engineering (an introduction) • The background and context for systems engineering • The Nine-System Model
2	Session 3: An introduction to systems and the system lifecycle (SLC) • Systems • Nature of systems • System behaviour • System properties • Emergence • Hierarchies of systems • Functional view of a system • Template for a system • Creating systems	Session 4: The Needs Identification State • The three parts of the Needs Identification State • Hard and soft systems • Feasibility studies • The Concept of Operations (CONOPS) • The difference between solution selection criteria and require-ments • Acquisition strategy decisions • Exercise • Systems engineering in the Needs Identification State using the Nine-System Model
3	Session 5: The Requirements State: 1 requirements • Specifications • MIL-STD-490 • Requirements analysis • Grammar of the requirement statement • Attributes of requirements • Types of requirements • Uses of requirements in the system lifecycle • Requirements management • Sources of requirements, acceptance criteria • The importance of well-written requirements • Some of the consequences of poorly written requirement	Session 6: The Requirements State: 2 Realization planning • Project plans • Milestone reviews • Requirements drive the work • Contents of project plans • Planning tools • Systems approach to project management • SEMP, TEMP and SHMEMP • Configuration management Session 7: The System Design State • An awareness of the factors involved in functional and physical partitioning of a system. • Analysis for determination of feasibility. • Factors to consider and monitor in the design for performance, cost, reliability, integration, test, maintainability and safety. • Design optimization. • Problem solving across subsystem boundaries. • Luz Case study
4	Session 8: The Subsystem Realization States • An awareness of the factors involved in functional and physical partitioning of a system. • Analysis for determination of feasibility. • Factors to consider and monitor in the design for performance, cost, reliability, integration, test, maintainability and safety. • Design optimization. • Problem solving across subsystem boundaries. • Luz Case study Session 9: The System Integration and System Test States • Awareness of the factors involved in integration of components into a system. • Integration of a system into its adjacent systems. • Design for integration. • Problem solving across subsystem boundaries.	Session 10: The Operations and Maintenance States • The role of systems engineers in the handover transient, operations and maintenance phases of the system lifecycle. • An awareness of the factors involved in managing changes and upgrades, teams, and control of phased sequential system releases. • Review of iteration, recursiveness and phased builds. • Change. Session 11: The Disposal State • Project terminations • Alternative methods of disposal • Considerations for disposal Session 12: Summary and Wrap Up • Recap of the module design • Summary of sessions

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Systems Approach to Project Management

JOSEPH KASSER

Dr. Joseph Kasser was a practising systems engineer and manager for 30 years before joining academia. 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 many other awards and commendations. He is an INCOSE Fellow, holds a Doctor of Science in Engineering Management from The George Washington University, and is both a Chartered Engineer and a Certified Manager. He is currently a Visiting Associate Professor at the National University of Singapore. His previous academic positions include being a Leverhulme Visiting Professor at Cranfield University, England and the Deputy Director and an Associate Research Professor at the Systems Engineering and Evaluation Centre in the University of South Australia.

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

1. Understand and be able to apply the systems approach to project management.
2. Know the methodology of project planning, monitoring and control.
3. Know how the methodology is applied.
4. Be able to plan and validate plans for techno-centric systems.
5. 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

Day 1	Day 2	Day 3	Day 4
• Introduction and overview • Management: General and project • Introduction to Case Study Project • Project planning • Milestone Reviews • Project planning exercise	• Project staffing • Project scheduling • Project costing • Reducing project schedule and cost	• Performance monitoring • Risk Management • Change management I (PDR)	• Impact of changes on cost and schedule • Change management II (CDR) • Change management III (TRR) • Human side of project management • Change management IV (DRR) • Summary and closeout

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Systems Thinking and Beyond

JOSEPH KASSER

Dr. Joseph Kasser was a practising systems engineer and manager for 30 years before joining academia. 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 many other awards and commendations. He is an INCOSE Fellow, holds a Doctor of Science in Engineering Management from The George Washington University, and is both a Chartered Engineer and a Certified Manager. He is currently a Visiting Associate Professor at the National University of Singapore. His previous academic positions include being a Leverhulme Visiting Professor at Cranfield University, England and the Deputy Director and an Associate Research Professor at the Systems Engineering and Evaluation Centre in the University of South Australia.

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

1. The ability to deal with open ended problems with no unique solutions.

2. Improved problem solving, systems and critical thinking abilities.

3. 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.

COURSE STRUCTURE

Day 1	Day 2	Day 3	Day 4
• Thinking and systems thinking • Systems thinking • Critical thinking	• Holistic thinking • Problem solving	• Decisions and decision making • The Nine-System Model • An introduction to systems	• Tackling real problems • Tackling real problems • Summary and wrap up

ADDITIONAL NOTES

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MBSE & SysML Introduction

MOHAMMAD CHAMI

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 courses.

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

- What is MBSE, modeling language, modeling method and modeling tool
- SysML basic concepts
- Why should we use MBSE and how it manages system engineering challenges
- How to start with MBSE, what to do and what not to do

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.

COURSE STRUCTURE

Day	Morning	Afternoon
1	• MBSE Introduction and core concepts • Why 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 to do and what not to do • Conclusion, feedback, QA and evaluation

ADDITIONAL NOTES

Course Pre-requisites

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

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MBSE & SysML Intermediate

MOHAMMAD CHAMI

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 courses.

Course Overview

This course provides the participants a solid foundation about 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
- How to model systems' requirements, structure, behavior and their traceability
- How to customize SysML for a particular application domain
- Learn how to deploy MBSE in your organization (team setup, goals definition, collaborative modeling, tool selection…)
- 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

- System and software engineers/architects
- Participants should have attended the "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 modeling on a specific example suiting your organization	• Behavioral 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 behavioral modeling on a specific example suiting your organization
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 modeling guidelines, tasks, deliverables, context, traceability, views…) • Exercise: Customize SysML for your method needs (Profiles, stereotypes, validation rules…)?	• 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

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Improving the Result of Reviews and Inspections

NIELS MALOTAUX

Niels Malotaux is an independent Project Coach and expert in optimizing project performance. He has some 40 year experience in designing electronic and software systems, at Delft University, in the Dutch Army, at Philips Electronics and 20 years leading a systems design company. Since 1998 he devotes his expertise to helping projects and organizations to deliver Quality On Time: delivering what the customer needs, when he needs it, to enable customer success. Tless well in practice.

Course Overview

Document Inspections are one of the most economical and necessary techniques for eliminating, and, even more important, 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 defects in a document, where they first found only one or two minor issues. This should give evidence that with proper education Reviews and Inspections indeed can provide the benefits promised.

In this course we will discuss the Goal of projects, define Quality and Defect, explain the concept and the effect of Zero Defects, provide an overview of types of Inspections (Walkthroughs, Reviews, Fagan, Cleanroom, Gilb/Graham, Early Inspections), which Inspection type to choose, and how to calculate the Return on Investment of Inspections. We'll exercise what you learnt on your own document.

Who should attend

Anyone who is producing documents, should be producing documents or is supposed to evaluate documents, like contracts, business cases, requirements, use cases, story cards, designs, drawings, code, test plans.

COURSE STRUCTURE

Day	Topics
1	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

ADDITIONAL NOTES

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 your 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!

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Fundamentals of System and Product Safety

JIM MATEER

Jim 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 within him presenting his research into 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 improve its management of airworthiness. For QineitQ Jim developed two system safety courses dealing with safety risk identification and assessment and safety management.

RICHARD MAGUIRE

Richard 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 Defence - Acquisition System Safety; and the Bundeswehr University Munich - Modelling Human Reliability.

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.
- For all stages of product's life-cycle, be able to outline the key elements associated with "designing for safety".
- 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 safety.

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