Honourcode, Inc.
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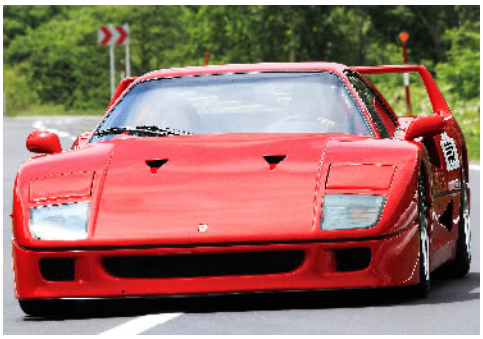
Fundamentals of Systems Engineering

A 2-Day Practical Workshop

The Basics of Creating Successful Systems

Today's complex systems present difficult challenges to develop. From military systems to aircraft to environmental and electronic control systems, development teams must face the challenges with an arsenal of proven methods. Individual systems are more complex, and systems operate in much closer relationship, requiring a system-of-systems approach to the overall design.

This workshop presents the fundamentals of a ***systems engineering*** approach to solving complex problems. It covers the underlying attitudes as well as the process definitions that make up systems engineering. The model presented is a research-proven combination of the best existing standards.



Participants in this workshop practice the processes on a realistic system development.

***You should attend this workshop if you are*:**

- Working in any sort of system development
- Project leader or key member in a product development team
- Looking for practical methods to use today

The course is aimed at

- Project leaders,
- Technical team leaders,
- Design engineers, and
- Others participating in system development

Topics Covered in the Course

Systems Engineering Model – An underlying process model that ties together all the concepts and methods. System thinking attitudes. Overview of the systems engineering processes. Incremental, concurrent processes and process loops for iteration. Technical and management aspects.

Where Do Requirements Come From? – Requirements as the primary method of measurement and control for systems development. Three steps to translate an undefined need into requirements; determining the system purpose/mission from an operational view; how to measure system quality, analyzing missions and environments; requirements types; defining functions and requirements.

Where Does a Solution Come From? – Designing a system using the best methods known today. What is an architecture? System architecting processes; defining alternative concepts; alternate sources for solutions; how to allocate requirements to the system components; how to develop, analyze, and test alternatives; how to trade off results and make decisions. Establishing an allocated baseline, and getting from the system design to the system. Systems engineering during ongoing operation.

Where Does the System Come From? – Building in quality during the development, and then checking it frequently. The relationship between systems engineering and systems testing. System integration purpose and methods. Technical analysis as a system tool. Verification at multiple levels: architecture, design, product. Validation at multiple levels; requirements, operations design, product.

Project Technical Leadership – How to successfully manage the technical aspects of the system development; planning the technical processes; assessing and controlling the technical processes, with corrective actions; use of risk management, configuration management, interface management to guide the technical development. How to guide and motivate technical teams; technical teamwork and leadership; virtual, collaborative teams; design reviews; technical performance measurement.

Summary - Review of the important points of the workshop. Interactive discussion of participant experiences that add to the material.

The Instructors

Dr. Eric Honour, **CSEP, INCOSE Fellow**, and former INCOSE President, has been in international leadership of the engineering of systems for two decades, part of a 40+ year career of complex systems development and operation. His energetic and informative presentation style actively involves class participants. He was the founding Chair of the INCOSE Technical Board in 1994, and served as Director of the Systems Engineering Center of Excellence (SECOE). He is on the editorial board for *Systems Engineering*. He has been a successful entrepreneur, systems engineer, engineering manager, and program manager at Harris , E-Systems, and Link, and was a Navy pilot. He has led or contributed to the development of 17 major systems, including Air Combat Maneuvering Instrumentation, Battle Group Passive Horizon Extension System, and National Crime Information Center. BSSE (Systems Engineering) from US Naval Academy, MSEE from Naval Postgraduate School, PhD from University of South Australia based on his ground-breaking work to quantify the value of systems engineering.

Dr. Scott Workinger has led innovative technology development efforts in complex, risk-laden environments for 30 years in the fields of manufacturing (automotive, glass, optical fiber), engineering and construction (nuclear, pulp & paper), and information technology (expert systems, operations analysis, CAD, collaboration technology). He currently teaches courses on program management and engineering and consults on strategic management and technology issues. Scott has a B.S in Engineering Physics from Lehigh University, an M.S. in Systems Engineering from the University of Arizona, and a Ph.D. in Civil and Environment Engineering from Stanford University.

Mr. Glen Francisco (CSEP, PMP) has over 17 years of experience developing new technologies, service, products, and applications for both private and government uses. He has a personable, engaging teaching style that keeps a class alive with information. He has worked as an engineer, Lead Systems Engineer, Project Engineer and Program Manager for a number of military & commercial companies to include Boeing (McDonnell Aircraft Company), Lockheed Martin (Martin Marietta), Texas Instruments, Raytheon, ELCAN Optical and DRS Technologies. His product systems have supported security surveillance, paramilitary (fire, police & EMS), automotive and industrial markets using passive thermal imaging technologies and other wavelength illuminated electo-optical imaging laser radar technologies. Glen has presented over a dozen papers at security & defense symposium. He holds multiple patents in active terminal guidance missile trajectory control and low cost plastic thermal management. He developed & introduced Thermal Imaging Cameras into the firefighting market in 2001, technology saving hundreds of lives and millions of dollars in property.