# A 1-day Systems Engineering Appreciation Workshop

## Workshop Description

Systems Engineering is the systematic application of Systems Thinking to the design and introduction of new systems. Applied correctly Systems Engineering provides considerable strategic advantage to an organization by reducing introduction times, improving system performance and reducing through life costs. Its relevance is the only proven approach to handling risks associated with highly complex products and services.

The purpose of the 1-day workshop is to provide participants with an appreciation of the processes and tools used in Systems Engineering so that they can plan and support staff in doing Systems Engineering.

It is an extremely intensive event based around the content of the 5-day Systems Engineering Fundamentals Course.

## Course Numbers and Who Should Attend?

The 1-day Systems Engineering Appreciation workshop can be delivered to up to 20 participants. Participants will have an appreciation of Systems Engineering, its process and tools. It is not a short-cut to the 5-day fundamentals course.

## Benefits to the Individual and Business

During an intensive day of teaching and practical 'hands on' exercises, participants will be challenged to develop the mind-set that can be applied to any system design irrespective of type, scale or context.

At the end of the workshop participants will:

- have an understanding the principles of systems thinking and how it applies to the creation of a new system through the appropriate blend of people, process and tools
- understand the critical role of requirements in engineering
- have an appreciation of the process and tools that can be used to gather, analyse and specify system requirements
- have an appreciation of the process and tools that can be used to generate and down-select alternative system design concepts and architectures
- be able to consider the impact on future business of adopting a systems approach to engineering

## Learning Approach

The learning approach is based on the Kolb learning cycle with a proportion of the workshop set aside for exercises to reinforce the learning. Indeed, many of the small group exercises involve a case study that provides a practical focus for the workshop and enables the delegates to practise the methodology and tools presented.

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## Workshop Agenda

| Time | Session | Outcomes |
|---|---|---|
| 0830 | Introduction and Objectives | Participants know the aims and objectives |
| 0845 | What is Systems Engineering | Participants:<br>• understand the concept of emergence as a key driver of System Engineering<br>• know the causes of undesirable emergent behaviour and the need for a systems approach to engineering and how it differs from traditional engineering |
| 0930 | An introduction to Systems Thinking | Participants:<br>• have had explained the concepts of systems thinking<br>• understand and appreciate the importance of key systems properties of: purpose, context, boundary and environment |
| 1045 | Systems Engineering in Practice | Participants:<br>• recognise the key ingredients to Systems Engineering as People, Process, Tools and Infrastructure<br>• understand that Systems Engineering is a fractal top-down process<br>• know the four design phases:<br>  ° Determine Requirements<br>  ° Create System Concept<br>  ° Design System<br>  ° Verify System |
| 1230 | Lunch | |
| 1315 | Determine System Requirements | Participants:<br>• know the purpose of the Determine System Requirements phase<br>• know the key process steps and what type of tools are appropriate<br>• realise the common and specific features of requirements<br>• understand the importance of system functionality as a system invariant |
| 1430 | Create System Concept | Participants:<br>• know the purpose of the Create System Concept Phase<br>• know the key process steps and what type of tools are appropriate<br>• know how to use system functionality to explore architectural and technological alternatives<br>• know how to down-select solutions |
| 1545 | Design System | Participants:<br>• appreciate the next steps in systems engineering and how it aligns with Robust Design and subsystem Specification |
| 1615 | Verify System | Participants:<br>• appreciate the purpose and role of verification and validation in Systems Engineering |
| 1700 | Summary and close | Participants are able to support systems engineering activity |

## Course Delivery and Costs

The cost of delivering the 1-day workshop, excluding delivery tutor accommodation and expenses, but including all courseware, is £1,500. VAT will apply at the prevailing rate.

The course can be tailored to suit individual customer's operations.

## More Information and Contact Details

For more information about the 1-day Systems Engineering Appreciation Workshop or any of our other Systems Engineering courses please contact **Dr Stuart Burge** on +44 (0) 7803 131614 or sburge@burgehugheswalsh.co.uk

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