

# **SYSTEMS ENGINEERING FOR SPECIALIST VEHICLES**

ADVANCED TRAINING COURSE

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**ABOUT THE COURSE**

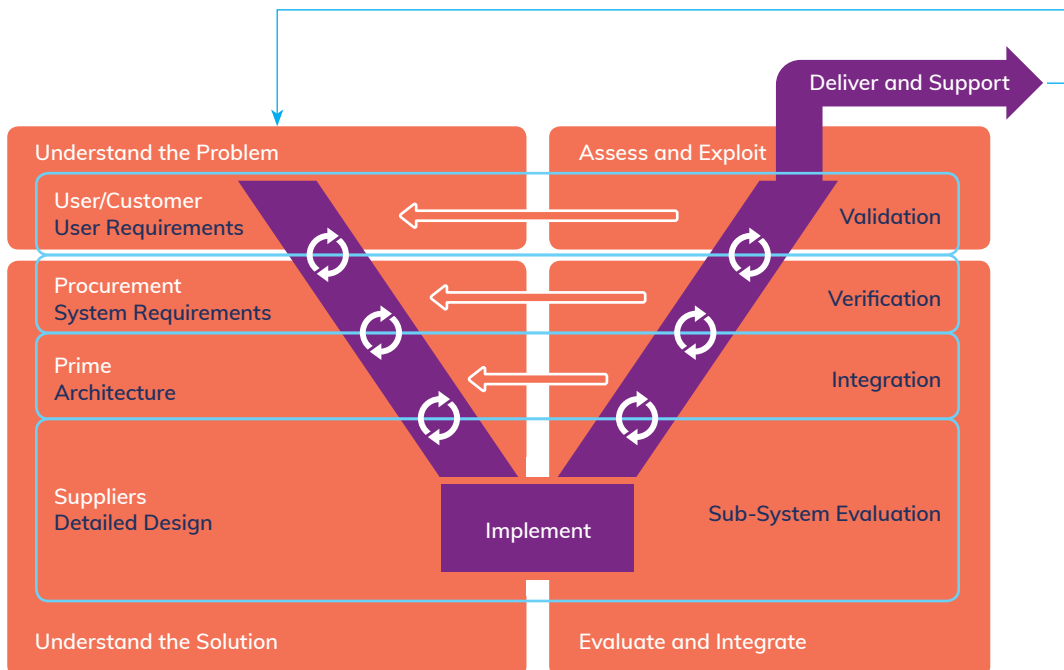
This course is led by experts from Optima Systems Consultancy, a Systems Engineering consultancy specialising in Defence.

The aim of the 4.5 day course is to provide an understanding of a full lifecycle systems approach to the development of specialist vehicles and the integration of their systems through structured training and exercises.

**SYLLABUS**

- The development of vehicles and the integration of Sensors, Communications, Automotive and other systems.
- Understanding of requirements Architecture.
- 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.

For more information and course booking details: [BMC.ac.uk/courses](http://BMC.ac.uk/courses)



# SYSTEMS ENGINEERING FOR SPECIALIST VEHICLES ADVANCED TRAINING COURSE

## MONDAY

Introduction to Systems Engineering.

What do we cover in an advanced class?

**Learning:** Why is SE important and what can it do for us?

Particular problems in the land platform space. Open discussion and engagement.

**Learning:** Reach a shared understanding of the issues - move towards a common schema for SE problems.

COFFEE

Stakeholder management covering RACI.

**Learning:** Understanding who is important in the problem and how to manage them.

Acceptance processes and Programme implications.

**Learning:** Understanding what success will look like.

BREAK

Requirements Engineering including tools and techniques to improve their 'quality'. Use Case analysis Scenario generation and ConOps/ConEmp/ConUse. Some practical examples based on the case study.

**Learning:** Understand the importance of knowing what the customer needs, wants, desires. Tools to assess completeness, coverage and understanding.

## TUESDAY

Context and structure. Architecting covering logical (functional) and physical views and the importance of each. Modelling to support options generation and selection.

**Learning:** Understand how dependencies, relationships and interfaces are impact the system development MCDA and other techniques for decision support.

COFFEE

Interfaces; their specification and management. A layered approach, including human interfaces.

**Learning:** Understand how interfaces are identified, specified, managed and the importance of addressing all aspects of interfacing and HFI.

BREAK

Product worked case study.

**Learning:** Understand the practical implications of what has been learnt so far. Developing the architecture and interfaces of the case study.

## WEDNESDAY

Integration. Using architecture and model information to optimise integration approach and support progressive assurance.

**Learning:** Understanding how things are integrated. The importance of the order and sequence.

COFFEE

Verification and Validation - how these combine to support evidence based design and product acceptance.

**Learning:** Understanding the difference between Verification and Validation. Understand the cost of doing V&V and the potential implications on Requirements, Integration and Acceptance.

BREAK

Product worked case study.

**Learning:** Understand the practical implications of what has been learnt so far. Developing the integration and V&V for the case study.

## THURSDAY

Safety and Security.

**Learning:** How these are identified, defined, managed, incorporated, demonstrated, verified, validated. What is the long term plan for the product or service?

Reliability.

**Learning:** How these are identified, defined, managed, incorporated, demonstrated, verified, validated. What is the long term plan for the product or service?

COFFEE

Sustainability and the Environment.

**Learning:** Through-life planning, technology insertion, disposal.

Technology management and road maps.

**Learning:** Through-life planning, technology insertion, disposal

BREAK

Review of the product case study - did it identify issues not addressed by SE?

How would the specialities of S&S, ARM, Sustainability and technology be addressed.

**Learning:** Reinforces learning across Systems Engineering delivery.

## FRIDAY

Managing Systems Engineering Processes | SEMP | Information Management | Project Management | Governance and Reviews Maturity growth | Change Management

COFFEE

Model Based Systems Engineering (MBSE): Capability | Requirements | Architecture | Information | Benefits

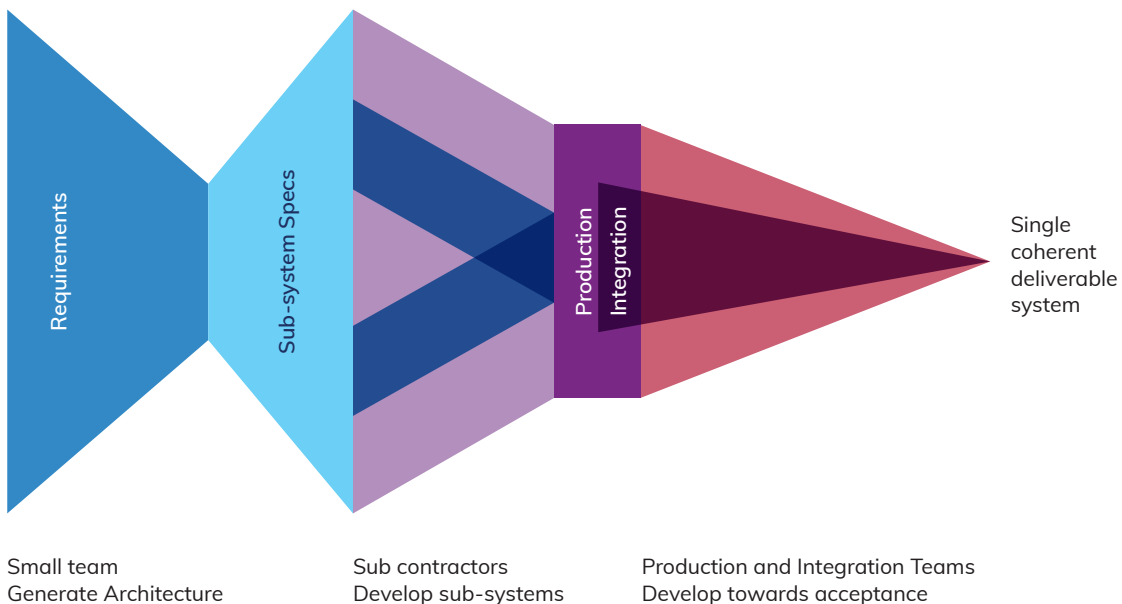
BREAK

Systems of Systems issues - a discussion | Close | Available for discussion.

WHAT YOU'LL LEARN

On successful completion you 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 requirements for Size, Weight, Power, communication bandwidth, etc. of armoured fighting vehicles.
- Understand the integration of humans as a system and their influence on the system's 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



ABOUT OPTIMA SYSTEMS CONSULTANCY

Optima Systems Consultancy is a Systems Engineering and Management consultancy based in Thornbury, North Bristol. We specialise in the Defence, Aerospace, Transport and Nuclear sectors, combining in-depth technical expertise with broader Systems Thinking to scope and solve clients' complex problems.

