

Systems Engineering Management

MSc, PGCert, PGDip



The Systems Challenges

Today, industry is given the responsibility for designing, building, operating and enhancing large, complex, highly integrated systems. It does this in the face of intense international competition. Therefore, an organisation's ability to deal with complex systems effectively is often what differentiates it in the marketplace and is critical for its future prosperity. At UCL the Centre for Systems Engineering (UCLse) provides training courses in Systems Engineering and Systems Engineering Management that enable organisations to develop and enhance their capability in this important area.

It is our philosophy that the realisation of large, complex projects is a combination of good systems engineering practice, strategic planning, project management and systems thinking. In our courses we instil this multi-level, long term view of systems development so that the organisation undertaking such developments can be pro-active in dealing with the dynamics of the modern business environment.

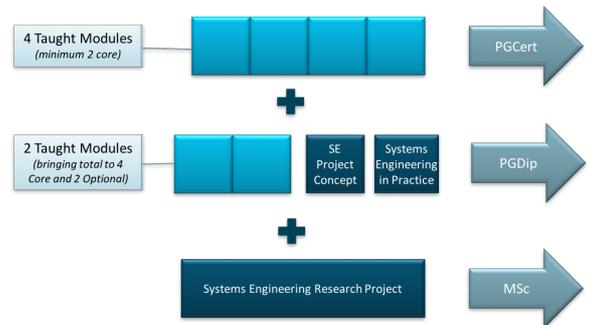
UCLse Principles of Systems Engineering

With over 50 years experience of developing complex systems for extremely demanding environments, we have developed five guiding principles that we know to work in the field.

- ▶ Principles Govern Process
- ▶ Seek Alternative Systems Perspectives
- ▶ Understand the Enterprise Context
- ▶ Integrate Systems Engineering and Project Management
- ▶ Invest in the Early Stages of Projects

Qualifications*

The MSc, PGCert, PGDip programme has been tailored for those involved in or newly undertaking a career in industry. The programme combines the academic rigour characteristic of UCL with the practical expertise gained through our collaboration with industry. This partnership has led to a modular approach, where industry-based students can choose the timing and nature of their studies to suit work demands. Alternatively a student may enrol in the full time mode taking one year to complete the MSc.



The MSc Systems Engineering Management programme may lead to one of three qualifications: an MSc, a Postgraduate Diploma (PGDip), or a Postgraduate Certificate (PGCert).

The PGDip is achieved by passing all elements of the MSc programme with the exception of the Research Project Dissertation (i.e. a total of 120 credits). The PGCert is obtained by gaining 60 credits and does not include any project work: the credits are achieved by passing four taught modules of which at least two have to be a Core Module.

Benefits to the Individual

We have developed our MSc (Masters in Science) in Systems Engineering Management from our expertise in space engineering and also our links with engineering and aerospace companies. Our courses will equip delegates with a powerful set of skills and knowledge:

- ▶ An integrated, interdisciplinary view of complex systems and systems engineering, covering issues associated with their development, deployment, maintenance, upgrade and disposal
- ▶ Key skills that are fully aligned with INCOSE's (International Council for Systems Engineering) core competencies and appropriate standards (e.g. ISO 15288)
- ▶ An understanding of systems development lifecycle options and processes. How to select the best and how to find the balance between prescription and empowerment
- ▶ Awareness and understanding of the context within which systems are developed including the economic and organisational limitations
- ▶ Necessary management skills and an understanding of the relationship between project management and systems development
- ▶ The ability to manage risk and the creation of robust systems
- ▶ A detailed appreciation of systems engineering as applied to a specific, chosen discipline and/or environment
- ▶ Direct experience and practice of the process through a significant industrial project

Benefits to Industry

By adopting effective Systems Engineering and Systems Engineering Management practices, an organisation can significantly reduce the risks of running over-budget, late delivery and stakeholder disappointment. Complex systems are often found to have unwanted emergent properties when deployed. By taking a broad perspective from the outset and dealing effectively with requirements management (including elicitation), systems design and modelling, and verification and validation, systems can be created with few, if any, unwanted or undesirable features and are hence more valuable and competitive.

Organisations we have worked with

Alexander Dennis, Airbus, Atkins Rail, BAE Systems, BERR, BP, Defra, DTI, ESA, EPSRC, GE Aviation, General Dynamics, GlaxoSmithKline, Home Office, INCOSE, Jaguar LandRover, NHS, Marshall ADG, Orange, PA Consulting, QinetiQ, Selex ES, STFC, Syngenta, Technology Strategy Board, TFL, Ultra Electronics and Xerox.

CORE MODULES	CREDIT
Systems Thinking & Engineering Management	15
Lifecycle Management	15
Risk, Reliability, Resilience	15
The Business Environment	15
Research Project Concept	15
Research Project	60
Systems Engineering in Practice	15
OPTIONAL MODULES	
Systems Design	15
Project Management **	15
Delivering Complex Projects	15
Technology Strategy	15
Defence and Security Systems	15
Space Systems	15
Rail Systems	15
TOTAL COURSE CREDITS	180

Notes:

1 credit represents approximately 10 hours learning time, in the form of lectures, discussion sessions, workshop activity, revision, independent study, project work or other activities. Each module has its own mixture of learning activities, but most will include a week-long block of intensive lectures.

Assessment: Each module is separately assessed through a combination of course work and a written examination. The project is assessed through written dissertation and subsequent oral examination. Delegates are required to pass all modules and the project. Candidates who perform well in all elements of the course may be awarded an MSc with Merit or Distinction.

* The MSc in Systems Engineering Management is accredited by the IET as a programme of further learning for registration as a Chartered Engineer.

** Module accredited by the Association for Project Management.

Contact

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