



DEFENSE ACQUISITION UNIVERSITY
ENG 101 - Fundamentals of Systems Engineering

150416

*Course Learning/Performance Objectives followed by its
enabling learning objectives on separate lines if specified.*

1	Summarize the Systems Engineering discipline
	State the DoD definition of Systems Engineering
	Summarize the scope of Systems Engineering activities
	Distinguish DoD and industry Systems Engineering roles
	List Systems Engineering challenges
2	Identify Systems Engineering Technical Processes and Technical Management Processes and their purposes
	Identify Systems Engineering Technical Processes
	Identify Systems Engineering Technical Management Processes
	Summarize the purpose of each technical process
	Summarize the purpose of each technical management process
3	Describe key Systems Engineering standards
	Describe the role of Systems Engineering standards
	Identify three key Systems Engineering standards
4	Summarize the roles played by a system model
	Define a 'system'
	Distinguish between an end product and an enabling product
	Identify uses of a system model
	Explain recursion and iteration with respect to Systems Engineering
	List the order of the Technical Processes that are involved in 'top-down' design
	List the order of the Technical Processes that are involved in 'bottom-up' realization
	Define various types of specifications
	Identify Systems Engineering activities by Defense Acquisition Phase
5	Outline key considerations for effective use of Systems Engineering
	Summarize the role of a Systems Engineering Plan
	Describe Robust Systems Engineering
	Explain Open Systems Architectures
	Outline how Evolutionary Acquisition is used
6	Describe the function of the Stakeholder Requirements Definition process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Stakeholder Requirements Definition Process
	Explain the difference between various types of requirements
	Outline the role of the systems IPT in the Stakeholder Requirements Definition Process
	Define Key Performance Parameters (KPPs), Critical Operational Issues (COIs), Measures of Effectiveness (MOEs), Measures of Suitability (MOSs) and Measures of Performance (MOPs)
	List attributes making up a quality requirement
7	Describe the function of the Requirements Analysis process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Requirements Analysis Process
	Outline the relationship of the Requirements Analysis Process to the Stakeholder Requirements Definition and Architecture Design Technical Processes
	Distinguish between Derived Requirements and Derived Technical Requirements
	Describe why bi-directional traceability is important
	Describe tools and techniques that can be used to assist in the Logical Analysis Process
	Explain the role of Quality Function Deployment
8	Describe the function of the Architecture Design process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Architecture Design process



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	Describe how the Architecture Design Process is related to other processes
	Define Key Interfaces and open systems
	Identify 'ilities' and other important Design Considerations
	Outline the types and uses of specifications
	Describe tools and techniques used to assist in the Architecture Design Process
9	Describe the function of the Implementation process as part of the Systems Engineering Process
	Describe the purpose, inputs, and outputs, and activities of the Implementation Process
	Recognize different forms of implemented products
	Describe the role and uses of the Technical Data Package
	Describe the role of Manufacturing Management
10	Describe the function of the Integration process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs and activities of the Integration Process
	Recognize different forms of integrated products
	List Integration Process considerations
11	Describe the function of the Verification process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Verification Process
	Describe the relationship of the TEMP to the Verification Plan
	Describe four methods used for verification
	Explain the differences between Test and Evaluation
	Describe the role of M&S in verification
	Explain how a Verification Matrix is used
	Identify sources of Verification deficiencies
12	Describe the function of the Validation process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs and activities of the Validation Process
	Explain how a Validation Matrix is used
	Describe the purpose of Operational Test & Evaluation
	Describe the purpose of Live Fire Test and Evaluation
	Describe how 'interoperability' is tested
	Distinguish between VV&A and IV&V
13	Describe the function of the Transition process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Transition Process
	Identify the two different forms of End Product transition
	Recognize why site surveys are important
	Describe the role of Packaging, Handling, Storage and Transportation (PHS&T)
14	Describe the function of the Technical Planning process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Technical Planning Process
	Identify typical technical management plans
	Identify specialty engineering technical management plans
	Describe the content of a Systems Engineering Plan (SEP)
	Explain the differences between event-based planning and calendar-based scheduling
15	Describe the function of the Requirements Management process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Requirements Management Process
	Explain why maintaining traceability between requirements is important
16	Describe the function of the Interface Management process as part of the Systems Engineering Process



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	Describe the purpose, inputs, outputs and activities of the Interface Management Process
	Identify different types of interfaces
	Distinguish between internal and external interfaces
	Describe the role of the government Program Office in interface management
	Explain the Interface Management Process functions of the Interface Control Working Group (ICWG) and various types of interface control documentation
17	Describe the function of the Risk Management process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Risk Management Process
	Describe how Risk Management is used
	Outline the importance of risk identification
	Summarize risk mitigation techniques
	Explain the role of risk tracking
18	Describe the function of the Configuration Management process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Configuration Management Process
	Explain the key functions of Configuration Management
	Identify configuration baselines, how they are established and their relevance
	Relate Technical Reviews to baselines
	Describe the scope and purpose of configuration verifications and audits
19	Describe the function of the Technical Data Management process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Technical Data Management Process
	Outline key considerations for technical data management
	Describe the government Program Office's role and responsibility in technical data management
20	Describe the function of the Technical Assessment process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Technical Assessment Process
	Outline the uses of Earned Value Management
	Describe the uses of Technical Performance Measures (TPMs) for determining progress against system requirements
	Explain key aspects of Technical Reviews
	Summarize the roles of a Technical Authority
21	Describe the function of the Decision Analysis process as part of the Systems Engineering Process
	Describe the purpose, inputs and outputs, and activities of the Decision Analysis Process
	Define 'trade space'
	Describe typical evaluation techniques
	Describe the different types of decision-making approaches