



Objectives Sheet

ENG 101 - Fundamentals of Systems Engineering

Course Learning/Performance Objectives followed by enabling learning objectives

ENG 101.U01.01	Summarize the Systems Engineering discipline
ENG 101.U01.01.01	State the DoD definition of Systems Engineering
ENG 101.U01.01.02	Summarize the scope of Systems Engineering activities
ENG 101.U01.01.03	Distinguish DoD and industry Systems Engineering roles
ENG 101.U01.01.04	List Systems Engineering challenges
ENG 101.U01.02	Identify Systems Engineering Technical Processes and Technical Management Processes and their purposes
ENG 101.U01.02.01	Identify Systems Engineering Technical Processes
ENG 101.U01.02.02	Identify Systems Engineering Technical Management Processes
ENG 101.U01.02.03	Summarize the purpose of each technical process
ENG 101.U01.02.04	Summarize the purpose of each technical management process
ENG 101.U01.03	Describe key Systems Engineering standards
ENG 101.U01.03.01	Describe the role of Systems Engineering standards
ENG 101.U01.03.02	Identify three key Systems Engineering standards
ENG 101.U01.04	Summarize the roles played by a system model
ENG 101.U01.04.01	Define a 'system'
ENG 101.U01.04.02	Distinguish between an end product and an enabling product
ENG 101.U01.04.03	Identify uses of a system model
ENG 101.U01.04.04	Explain recursion and iteration with respect to Systems Engineering
ENG 101.U01.04.05	List the order of the Technical Processes that are involved in 'top-down' design
ENG 101.U01.04.06	List the order of the Technical Processes that are involved in 'bottom-up' realization
ENG 101.U01.04.07	Define various types of specifications
ENG 101.U01.04.08	Identify Systems Engineering activities by Defense Acquisition Phase
ENG 101.U01.05	Outline key considerations for effective use of Systems Engineering
ENG 101.U01.05.01	Summarize the role of a Systems Engineering Plan
ENG 101.U01.05.02	Describe Robust Systems Engineering
ENG 101.U01.05.03	Explain Modular Open Systems Architectures
ENG 101.U01.05.04	Summarize uses of Modeling and Simulations
ENG 101.U01.05.05	Outline how Evolutionary Acquisition is used
ENG 101.U01.05.06	Recognize ethical issues
ENG 101.U02.01	Describe the function of the Stakeholder Requirements Definition process as part of the Systems Engineering Process
ENG 101.U02.01.01	Describe the purpose, inputs and outputs, and activities of the Stakeholder Requirements Definition Process
ENG 101.U02.01.02	Explain the difference between various types of requirements
ENG 101.U02.01.03	Outline the role of the systems IPT in the Stakeholder Requirements Definition Process
ENG 101.U02.01.04	Define Key Performance Parameters (KPPs), Critical Operational Issues (COIs), Measures of Effectiveness (MOEs), Measures of Suitability (MOSs) and Measures of Performance (MOPs)
ENG 101.U02.01.05	List attributes making up a quality requirement
ENG 101.U02.02	Describe the function of the Requirements Analysis process as part of the Systems Engineering Process
ENG 101.U02.02.01	Describe the purpose, inputs and outputs, and activities of the Requirements Analysis Process
ENG 101.U02.02.02	Outline the relationship of the Requirements Analysis Process to the Stakeholder Requirements Definition and Architecture Design Technical Processes
ENG 101.U02.02.03	Distinguish between Derived Requirements and Derived Technical Requirements
ENG 101.U02.02.04	Describe why bi-directional traceability is important
ENG 101.U02.02.05	Describe tools and techniques that can be used to assist in the Requirements Analysis Process
ENG 101.U02.02.06	Explain the role of Quality Function Deployment
ENG 101.U02.03	Describe the function of the Architecture Design process as part of the Systems Engineering Process
ENG 101.U02.03.01	Describe the purpose, inputs and outputs, and activities of the Architecture Design process
ENG 101.U02.03.02	Describe how the Architecture Design Process is related to other processes



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ENG 101.U02.03.03	Define Key Interfaces and open systems
ENG 101.U02.03.04	Identify 'ilities' and other important Design Considerations
ENG 101.U02.03.05	Outline the types and uses of specifications
ENG 101.U02.03.06	Identify the sources of Enabling Product Requirements
ENG 101.U02.03.07	Describe tools and techniques used to assist in the Architecture Design Process
ENG 101.U02.04	Describe the function of the Implementation process as part of the Systems Engineering Process
ENG 101.U02.04.01	Describe the purpose, inputs, and outputs, and activities of the Implementation Process
ENG 101.U02.04.02	Recognize different forms of implemented products
ENG 101.U02.04.03	Describe the role and uses of the Technical Data Package
ENG 101.U02.04.04	Describe the role of Manufacturing Management
ENG 101.U02.05	Describe the function of the Integration process as part of the Systems Engineering Process
ENG 101.U02.05.01	Describe the purpose, inputs and outputs and activities of the Integration Process
ENG 101.U02.05.02	Recognize different forms of integrated products
ENG 101.U02.05.03	List Integration Process considerations
ENG 101.U02.06	Describe the function of the Verification process as part of the Systems Engineering Process
ENG 101.U02.06.01	Describe the purpose, inputs and outputs, and activities of the Verification Process
ENG 101.U02.06.02	Describe the relationship of the TEMP to the Verification Plan
ENG 101.U02.06.03	Describe four methods used for verification
ENG 101.U02.06.04	Explain the differences between Test and Evaluation
ENG 101.U02.06.05	Describe the role of M&S in verification
ENG 101.U02.06.06	Explain how a Verification Matrix is used
ENG 101.U02.06.07	Identify sources of Verification deficiencies
ENG 101.U02.07	Describe the function of the Validation process as part of the Systems Engineering Process
ENG 101.U02.07.01	Describe the purpose, inputs and outputs and activities of the Validation Process
ENG 101.U02.07.02	Explain how a Validation Matrix is used
ENG 101.U02.07.03	Identify sources of validation deficiencies
ENG 101.U02.07.04	Describe the purpose of Operational Test & Evaluation
ENG 101.U02.07.05	Describe the purpose of Live Fire Test and Evaluation
ENG 101.U02.07.06	Describe how 'interoperability' is tested
ENG 101.U02.07.07	Distinguish between VV&A and IV&V
ENG 101.U02.08	Describe the function of the Transition process as part of the Systems Engineering Process
ENG 101.U02.08.01	Describe the purpose, inputs and outputs, and activities of the Transition Process
ENG 101.U02.08.02	Identify the two different forms of End Product transition
ENG 101.U02.08.03	Recognize why site surveys are important
ENG 101.U02.08.04	Describe the role of Packaging, Handling, Storage and Transportation (PHS&T)
ENG 101.U03.01	Describe the function of the Technical Planning process as part of the Systems Engineering Process
ENG 101.U03.01.01	Describe the purpose, inputs and outputs, and activities of the Technical Planning Process
ENG 101.U03.01.02	Identify typical technical management plans
ENG 101.U03.01.03	Identify specialty engineering technical management plans
ENG 101.U03.01.04	Describe the content of a Systems Engineering Plan (SEP)
ENG 101.U03.01.05	List the essential areas that shall be addressed in a SEP
ENG 101.U03.01.06	Explain the differences between event-based planning and calendar-based scheduling
ENG 101.U03.02	Describe the function of the Requirements Management process as part of the Systems Engineering Process
ENG 101.U03.02.01	Describe the purpose, inputs and outputs, and activities of the Requirements Management Process
ENG 101.U03.02.02	Explain why maintaining traceability between requirements is important
ENG 101.U03.02.03	List reasons the requirements change



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ENG 101.U03.02.04	Explain why maintaining traceability between requirements is important
ENG 101.U03.03	Describe the function of the Interface Management process as part of the Systems Engineering Process
ENG 101.U03.03.01	Describe the purpose, inputs, outputs and activities of the Interface Management Process
ENG 101.U03.03.02	Identify different types of interfaces
ENG 101.U03.03.03	Distinguish between internal and external interfaces
ENG 101.U03.03.04	Describe the role of the government Program Office in interface management
ENG 101.U03.03.05	Explain the Interface Management Process functions of the Interface Control Working Group (ICWG) and various types of interface control documentation
ENG 101.U03.04	Describe the function of the Risk Management process as part of the Systems Engineering Process
ENG 101.U03.04.01	Describe the purpose, inputs and outputs, and activities of the Risk Management Process
ENG 101.U03.04.02	Describe how Risk Management is used
ENG 101.U03.04.03	Outline the importance of risk identification
ENG 101.U03.04.04	Summarize risk analysis
ENG 101.U03.04.05	Describe risk mitigation
ENG 101.U03.05	Describe the function of the Configuration Management process as part of the Systems Engineering Process
ENG 101.U03.05.01	Describe the purpose, inputs and outputs, and activities of the Configuration Management Process
ENG 101.U03.05.02	Explain the key functions of Configuration Management
ENG 101.U03.05.03	Identify configuration baselines, how they are established and their relevance
ENG 101.U03.05.04	Relate Technical Reviews to baselines
ENG 101.U03.05.05	Identify typical technical baseline work products
ENG 101.U03.05.06	Describe the scope and purpose of configuration verifications and audits
ENG 101.U03.06	Describe the function of the Technical Data Management process as part of the Systems Engineering Process
ENG 101.U03.06.01	Describe the purpose, inputs and outputs, and activities of the Technical Data Management Process
ENG 101.U03.06.02	Outline key considerations for technical data management
ENG 101.U03.06.03	Describe the government Program Office's role and responsibility in technical data management
ENG 101.U03.07	Describe the function of the Technical Assessment process as part of the Systems Engineering Process
ENG 101.U03.07.01	Describe the purpose, inputs and outputs, and activities of the Technical Assessment Process
ENG 101.U03.07.02	Outline the uses of Earned Value Management
ENG 101.U03.07.03	Describe the uses of Technical Performance Measures (TPMs) for determining progress against system requirements
ENG 101.U03.07.04	Explain key aspects of Technical Reviews
ENG 101.U03.07.05	Summarize the roles of a Technical Authority
ENG 101.U03.08	Describe the function of the Decision Analysis process as part of the Systems Engineering Process
ENG 101.U03.08.01	Describe the purpose, inputs and outputs, and activities of the Decision Analysis Process
ENG 101.U03.08.02	Define 'trade space'
ENG 101.U03.08.03	Describe typical evaluation techniques
ENG 101.U03.08.04	Describe the different types of decision-making approaches
ENG 101.U03.08.05	Describe the role of Modeling and Simulation (M&S) in decision analysis