



FLYON AERO

AVIATION TRAINING CENTER

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By OXYGEN LABS Srl Unipersonale

SYLLABUS

Introduction to Systems Engineering

(FLY Course code: 019-C)

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Introduction

This course presents the fundamentals of systems engineering and is structured to provide an overview of the systems engineering practices. It explains the system engineering process across the entire system life cycle and analyze all the critical activities and responsibilities of the systems engineers during the system development phases, from the definition of the operational requirements to the system verification and validation activities. Systems engineering methods and tools and planning, organization and management issues are also covered. The course approach is based on the instructor's hands and experience and on the lessons learned from a lengthy career in developing systems.

Summary

Course type	Classroom course
Target	<ul style="list-style-type: none"> • Certifying staff • Technicians • Quality Personnel • Maintainer
Duration	3 days
Course location	FlyOn.Aero Aviation Training Center – Tortona
Language	Italian / English
Contents	<ul style="list-style-type: none"> • Introduction to System Engineering • Systems Engineering Process • The Systems Engineering in the System Development Cycle • Systems Engineering – Methods and tools • Systems Engineering Program Planning, Organization and Management
Exam	Yes
Certificate	FlyOn.Aero Certificate

Syllabus

1. INTRODUCTION TO SYSTEMS ENGINEERING

- 1.1. The Current Environment
- 1.2. The Need for Systems Engineering
- 1.3. Definition of a System
- 1.4. Definition of Systems Engineering
- 1.5. The System Life Cycle

2. THE SYSTEMS ENGINEERING PROCESS

- 2.1. The Systems Engineering Process in the Life Cycle
- 2.2. The Systems Engineering Tasks
- 2.3. Total Quality Management

3. THE SYSTEMS ENGINEERING IN THE SYSTEM DEVELOPMENT CYCLE

- 3.1. Overview of the System Development Cycle
 - 3.1.1. Model Based System Development
- 3.2. System Design Requirements and Specifications
 - 3.2.1. User Requirements
 - 3.2.2. Feasibility Analysis
 - 3.2.3. Operational Concepts and Requirements
 - 3.2.4. System Design Requirements
 - 3.2.5. System Specification
- 3.3. Preliminary Design
 - 3.3.1. Top Down Design Approach
 - 3.3.2. Bottom Up Design Approach
 - 3.3.3. Definition of the Functional Architecture
 - 3.3.4. Hardware/Software Partitioning
 - 3.3.5. Definition of the Physical Architecture
 - 3.3.6. Interface Definition and Control
 - 3.3.7. System Cost Estimate
- 3.4. System Design and Development
 - 3.4.1. System Modeling, Simulation and Rapid Prototyping
 - 3.4.2. System Performance Measurements

- 3.4.3. Hardware Specification
- 3.4.4. Software Specification
- 3.4.5. Subcontractors Monitoring and Control
- 3.4.6. Configuration Control

3.5. System Integration, Verification and Validation

- 3.5.1. The Integration and Evaluation Process
- 3.5.2. System Test Requirements
- 3.5.3. System Test Plan
- 3.5.4. Test Performance and Evaluation
- 3.5.5. System Modifications
- 3.5.6. Software Testing

4. SYSTEMS ENGINEERING METHODS AND TOOLS

4.1. Computer Aided Technologies and Tools

- 4.1.1. Computer Aided Design
- 4.1.2. Computer Aided Manufacturing
- 4.1.3. Computer Aided Logistic Support

4.2. Modeling and Simulation Tools

- 4.2.1. Functional Modeling and Simulation Tools
- 4.2.2. Physical Modeling and Simulation Tools
- 4.2.3. Rapid Prototyping
- 4.2.4. Modeling and Simulation Languages and Standards
- 4.2.5. Software Modeling and Automatic Code Generation

4.3. System Integration, Verification and Validation Facilities

- 4.3.1. Software Verification Facilities
- 4.3.2. System Integration Facilities
- 4.3.3. Operational Scenario Simulators

4.4. Concurrent Engineering

- 4.4.1. Definition
- 4.4.2. Need for Concurrent Engineering
- 4.4.3. Basic Principles of Concurrent Engineering
- 4.4.4. Distributed System Design and Analysis
- 4.4.5. Distributed Interactive Simulation
- 4.4.6. Distributed System Verification

5. SYSTEMS ENGINEERING PROGRAM PLANNING, ORGANIZATION AND MANAGEMENT

- 5.1. Systems Engineering Management Plan
- 5.2. Risk Management Plan
- 5.3. Technical Reviews
- 5.4. Systems Engineering Organization
- 5.5. Work Breakdown Structure
- 5.6. Suppliers Selection and Management