

## **Introduction to C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance)**

- Introduction to Command & Control (C2)
- C2 based Terms and Definitions
- Communications and Computers
- Intelligence, Surveillance and Reconnaissance (ISR)

## **C2 Processes & C4ISR Architecture Framework**

- The OODA Loop
- Operational View C2 Architecture
- DoD Architecture Framework (DoDAF)
- C4ISR Architecture View, Definitions and Roles

## **Modular Command and Control Evaluation Structure (MCES)**

- C2 System Boundary Formulation
- C2 Process Definition
- Integration of Statics and Dynamics
- Specification of Measures
- Aggregation of measures

## **Decision Making**

- Decision Making Process
- Decision Making Styles and Decision Support
- Decision Analysis

## **Combat Theory & Combat Modeling**

- Introduction to combat theory & combat modeling
- Combat Processes
- Case Study: Navy Battle Modeling
- Deterministic models

- Monte Carlo models
- DIME on PMESII models

### **Attrition Models & Measure of Effectiveness**

- Measure of Effectiveness
- Estimating Future Performance
- Lanchester Equations
- Not-Attrition based Models

### **Introduction to ISR**

- Overview of Intelligence, Surveillance and Reconnaissance (ISR)
- ISR Processes
- Information and knowledge obtained through observation, investigation, analysis, or understanding
  - o Imagery Intelligence-IMINT
  - o Signals Intelligence -SIGINT
  - o Measurement and Signatures Intelligence (MASINT)
- Surveillance versus Reconnaissance

### **Sensor & Data Fusion**

- Platforms, Sensor Systems and Target Signatures
- Signals Intercept and Direction Finding
- IR- Multi-, Hyper-, Ultra-Spectral
- Sensor Fusion

### **Communications**

- Communications: Overview, Fundamentals and Definitions,
- Networks, Coding and Error Detection
- Military Communication Channels
- SATCOM and C4ISR Architecture Evolution

- Digital Security

### **Interoperability - Enterprise Architecture as Strategy**

- Interoperability Principles
- Syntactic interoperability
- Semantic interoperability
- Cross-domain interoperability
- Service Oriented Architectures
- Open Standards for interoperability

### **Network Enabled Capability (NEC) and Network Centric Warfare (NCW)**

- NEC Concepts & Principles
- Information Sharing, Collaboration
- Shared Situational Awareness
- NCW Principles, Network Centric Operations
- NCW Frameworks & Architectures

### **Defense Information Enterprise (IE) Architecture (DIEA)**

- Operational Requirements Basis
- Required IE Capabilities
- Services View
- Linkage of Activities, Services, and Rules to Capabilities
- Compliance Criteria
- Illustrative Use Cases

### **An Example - Naval C4ISR System**

- Sensors
- Weapons
- Air Defense Systems

- Submarine Defense Systems
- Surface Defense Systems
- Navigation
- Link Systems (Link 11, 16, 22 etc.)