

Military Communications

Course Syllabus Overview

Duration – 5 days (Estimate)

01. Introduction

- Information-Centric Warfare
- Implications of Technology Development

02. Scenario-Based Capability Planning in C2 Context

- Definitions
- C2 and Network-Centric Warfare
- Capability-Based Planning and Threat-Based Planning
- Key Military Definitions
- Joint Capability Areas
- Military Communications Scenario in the Future Battlefield

03. Communications Systems

- Requirements for Military Communications
- Communications Chain
- Generic Parameters and Characteristics of Communications Systems
- Link 16
- Link 22
- Variable Message Format (VMF)
- Joint Range Extension Application Protocol (JREAP)
- BOWMAN

04. Situational and Context Awareness

- Context Awareness
- Augmented Reality (AR)-Based Applications
- Artificial Intelligence (AI)-Supported Situational Awareness
- Context-Aware Military AR Applications for Improved Situational Awareness

05. Radio Wave Propagation

- Radio Frequency (RF) Propagation Phenomena in Wireless Communications Media
- Trade-Offs Between Frequency, Antenna Size, and Node Mobility
- Radio Horizon and Fresnel Zones
- Receiver Sensitivity and Quality of Service as Measures of Performance
- Coarse- and Fine-Grained Calculation of Radio Coverages
- Selection of Radio Wave Propagation equations and Models

06. Wireless Sensor Networks (WSN)

- Building Blocks of Sensor Networks
- Sensor Types
- Sensor Network Intelligence

- Utilisation of Information Collected by Sensor Networks
- Energy Issues of WSNs
- Internet of Things (IoT)'s Role in both WSNs and Communications

07. Software-Defined Radio and Cognitive Radio

- Spectrum Management of Military and Civilian Users
- Software-Defined Radio
- System-On-Chip as Modern Software-Defined Radio and Cognitive Radio Platform
- Cognitive Radio
- Challenges on Software-Defined Radio Interoperability
- Software-Defined Radio and Cognitive Radio Research and Development Directions
- Military Software-Defined Radio
- Military Cognitive Radio

08. Unmanned Aerial and Ground Platforms

- Data Collection
- Development of Unmanned Systems
- Unmanned Aerial Vehicles
- Unmanned Ground Vehicles
- Command and Control
- Autonomy, Teaming, and Swarming of Unmanned Platforms

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