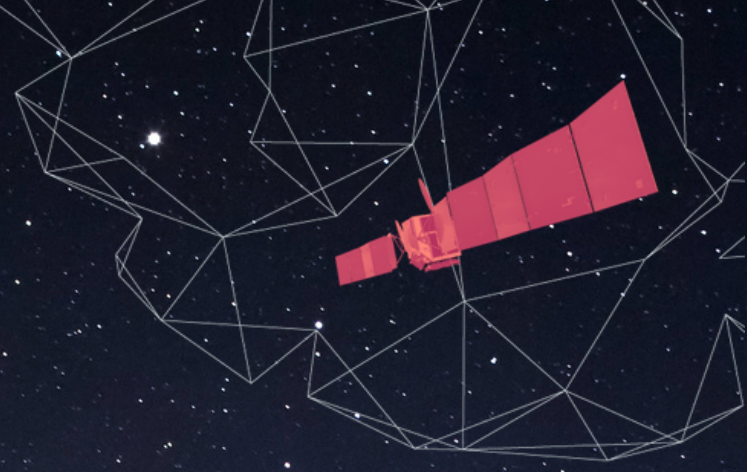


ENTRUSTED training CURRICULUM

ONLINE COURSE

Fundamentals
of Secure Satellite
Communications





INTRODUCTION

- TRAINEES' PROFILE
- EDUCATIONAL OBJECTIVES
- COURSE STRUCTURE

MODULE 1 - INTRODUCTION TO SATCOM

1. SATCOM INTRODUCTION

- 1.1 WHAT IS SATCOM?
- 1.2 SATCOM HISTORY
- 1.3 SATCOM ARCHITECTURE
- 1.4 WHERE ARE COMMUNICATION SATELLITES IN SPACE?
- 1.5 SATCOM BENEFITS
- 1.6 SATCOM DRAWBACKS

2. SATCOM USERS

- 2.1 BACKGROUND INFORMATION
- 2.2 MAIN USAGE
- 2.3 SATCOM USERS
 - 2.3.1 MILITARY
 - 2.3.2 MARITIME
 - 2.3.3 TELCOM PROVIDERS
 - 2.3.4 GOVERNMENTS
 - 2.3.5 CORPORATE NETWORK
 - 2.3.6 ENERGY COMPANIES
 - 2.3.7 CIVIL AERO
 - 2.3.8 MEDIA
 - 2.3.9 NGOS
 - 2.3.10 MINING
 - 2.3.11 HOUSEHOLDS
 - 2.3.12 SCIENTIFIC INSTITUTES
 - 2.3.13 COMPANIES WITH A FLEET OF VEHICLES

3. STANDARDISATION AND REGULATORY BODIES

- 3.1 OVERVIEW OF STANDARDISATION AND REGULATORY BODIES
- 3.2 ITU
- 3.3 ITU RADIO REGULATIONS
- 3.4 ETSI
- 3.5 DVB
- 3.6 3GPP

4. SATELLITE VALUE CHAIN AND ACTORS

- 4.1 OVERVIEW OF SATELLITE VALUE CHAIN AND ACTORS
- 4.2 SATELLITE MANUFACTURERS
- 4.3 SATELLITE LAUNCHER / SPACEPORT PROVIDERS
- 4.4 SATELLITE OPERATORS
- 4.5 SATELLITE DISTRIBUTION PARTNERS
- 4.6 SATELLITE SERVICE PROVIDERS
- 4.7 END USERS
- 4.8 OTHERS
- 4.9 SATCOM STAKEHOLDERS
 - 4.1.1 WHO IS WHO: SATELLITE MANUFACTURERS
 - 4.1.2 WHO IS WHO: SATELLITE OPERATORS
 - 4.1.3 WHO IS WHO: SDP/SSP
 - 4.1.4 WHO IS WHO: USER TERMINAL AND GATEWAY MANUFACTURERS
 - 4.1.5 WHO IS WHO: EQUIPMENT MANUFACTURERS
- 4.10 VIDEO - SATCOM GROUND AND USER SEGMENTS

MODULE 2 - SATCOM TECHNOLOGY IN DEPTH

1. BASIC OVERVIEW OF AIR INTERFACE CONCEPTS

- 1.1 ELECTROMAGNETIC WAVE
- 1.2 RADIO WAVE
- 1.3 LINK BUDGET
- 1.4 SPECTRUM
- 1.5 FREQUENCY BANDS

2. SATCOM ARCHITECTURE: SATELLITE

- 2.1 GLOBAL ARCHITECTURE
- 2.2 DEFINITION
- 2.3 BUS
- 2.4 PAYLOAD
 - 2.4.1 INPUT SECTION
 - 2.4.2 INTERMEDIATE SECTION
 - 2.4.3 OUTPUT SECTION
 - 2.4.4 TRANSPORTER
 - 2.4.5 ANTENNA
- 2.5 ASSEMBLY / INTEGRATION / TEST
- 2.6 SATELLITE MASS
- 2.7 GEO VS CONSTELLATION

3. SATCOM ARCHITECTURE: GROUND SEGMENT

- 3.1 GROUND SEGMENT
- 3.2 GROUND STATIONS
- 3.3 OPERATION CONTROL CENTRE
- 3.4 PAYLOAD CONTROL CENTRE
- 3.5 MISSION CONTROL CENTRE
- 3.6 GROUND NETWORK / WAN
- 3.7 ADDITIONAL ENTITIES
- 3.8 STAR TOPOLOGY
- 3.9 POINT-TO-POINT TOPOLOGY

4. SATCOM ARCHITECTURE: SECURITY

- 4.1 SECURITY IN SATCOM
- 4.2 REQUIREMENTS
- 4.3 THREATS AND ATTACKS
- 4.4 USER SEGMENT
- 4.5 SPACE SEGMENT
- 4.6 PROTECTION MEASURES - RF ASPECTS
- 4.7 GROUND SEGMENT
- 4.8 PROTECTION MEASURES - NETWORK ASPECTS

5. AIR COMMUNICATION THROUGH A SATELLITE LINK

- 5.1 BASIC ANTENNA TECHNOLOGY
- 5.2 SIGNAL AMPLIFICATION
- 5.3 MODULATION AND CODING
- 5.4 LINK BUDGET
- 5.5 OVERVIEW OF STANDARDS
- 5.6 RADIO FREQUENCY RESOURCE MANAGEMENT

6. SATELLITE USER TERMINALS

- 6.1 INTRODUCTION
- 6.2 FIXED TERMINAL
- 6.3 TRANSPORTABLE TERMINAL
 - 6.3.1 BGAN TERMINAL
 - 6.3.1.1 VIDEO - USER TERMINAL: BROADBAND GLOBAL AREA NETWORK
 - 6.3.2 MANPACK
 - 6.3.3 FLY-AWAY TERMINAL
 - 6.3.3.1 VIDEO - USER TERMINAL: FLY-AWAY ANTENNA SYSTEM
 - 6.3.3.2 VIDEO - USER TERMINAL: SELF-POINTING FLY-AWAY TERMINAL
 - 6.3.4 VEHICULAR TERMINAL
 - 6.3.5 MOBILE TERMINALS
- 6.4 SATELLITE PHONE AND IOT
 - 6.4.1 VIDEO - USER TERMINAL: SATELLITE PHONE
- 6.5 IOT APPLICATIONS

MODULE 3 - SATCOM USE CASES

1. SATCOM USE CASES

- 1.1 INTERNET CONNECTIVITY IN UNSERVED / UNDERSERVED AREAS
- 1.2 BACK-UP CONNECTIVITY
- 1.3 CRISIS COMMUNICATIONS
 - 1.3.1 VIDEO - DISASTER RESPONSE COMMUNICATIONS (EMERGENCY.LU)
 - 1.3.2 VIDEO - USER TERMINAL: MANPACK
 - 1.3.3 VIDEO - USER TERMINAL: DRIVE-AWAY ANTENNA SYSTEM
- 1.4 MILITARY SOLUTIONS
- 1.5 B2B COMMUNICATIONS
- 1.6 BACKHAULING CONNECTIVITY
 - 1.6.1 VIDEO - SATELLITE BACKHAULING FOR 4G/5G NETWORKS

- 1.7 IN MOTION COMMUNICATION (LAND, AIR, SEA)
 - 1.7.1 VIDEO - MOBILE SATCOM TEST BENCH TRUCK (OTM TERMINAL)
- 1.8 UAV VIDEO AND DATA COMMUNICATION
 - 1.8.1 VIDEO - SES SATCOM SERVICES USED BY DEA AVIATION LTD.
 - 1.8.2 VIDEO - REMOTE CONTROL OF AN UAV PAYLOAD
- 1.9 IOT COMMUNICATIONS
 - 1.9.1 VIDEO - IOT OVER SATCOM USE CASE

2. NEW DEVELOPMENTS

- 2.1 NEW TELECOM TECHNOLOGIES
 - 2.1.1 DIGITAL TRANSPARENT PROCESSOR
 - 2.1.2 SOFTWARE-DEFINED RADIO
 - 2.2.2.1 VIDEO - SOFTWARE DEFINED RADIO (SDR) TECHNOLOGY
- 2.2 OPTICAL LINK
- 2.3 MEGA CONSTELLATIONS

MODULE 4 - GOVSATCOM SERVICES FOR EU MEMBER STATES

1. INTRODUCTION TO GOVERNMENTAL SATCOM SERVICES AND SYSTEMS

- 1.1 IN-NEED OF SECURE SATCOM
- 1.2 SECURE SATCOM FOR GOVERNMENTAL USERS
- 1.3 GOVSATCOM USERS
- 1.4 GOVSATCOM USE CASES
 - 1.4.1 SURVEILLANCE USE CASES
 - 1.4.2 CRISIS MANAGEMENT USE CASES
 - 1.4.3 KEY INFRASTRUCTURES USE CASES
 - 1.4.4 SPECIFIC USE CASES

2. PRESENTATION OF EXISTING NATIONAL GOVSATCOM SYSTEMS IN OPERATION

- 2.1 CURRENT SATCOM SYSTEMS IN EU
- 2.2 GOVSATCOM CAPACITY IN EU MEMBER STATES
 - 2.2.1 VIDEO - GOVSAT-1 SATELLITE

3. PRECURSOR POOLING AND SHARING INITIATIVES AND RELATED ACTIVITIES

- 3.1 EDA SATCOM PROJECTS IN SUPPORT OF EU MEMBER STATES AND EU CSDP ACTORS
- 3.2 EDA GOVSATCOM POOLING AND SHARING DEMONSTRATION PROJECT
- 3.3 EU SATCOM MARKET
- 3.4 EU GOVSATCOM PRECURSOR PROGRAMME
 - 3.4.1 PACIS PROJECTS

4. EU GOVSATCOM COMPONENT

- 4.1 GOVERNMENTAL SATELLITE COMMUNICATIONS
- 4.2 UNION SPACE PROGRAMME 2021-2027
 - 4.2.1 THE GOVSATCOM COMPONENT
 - 4.2.2 GOVSATCOM SERVICE PROVISION
- 4.3 UNION SPACE PROGRAMME GOVSATCOM COMPONENT
- 4.4 USER CONSULTATIONS
- 4.5 ENTRUSTED PROJECT
 - 4.5.1 ENTRUSTED CONSORTIUM
 - 4.5.2 PROJECT RATIONAL
 - 4.5.3 PROJECT CONCEPT
 - 4.5.4 ENTRUSTED SURVEY
- 4.6 GOVSATCOM HUBS
 - 4.6.1 PROCUREMENT OF GOVSATCOM HUBS
- 4.7 GOVSATCOM INNOVATIONS
- 4.8 HORIZON-EUSPA-2022-SPACE-02-61: GOVSATCOM SERVICE DEVELOPMENTS AND DEMONSTRATIONS
- 4.9 CONCLUSIONS
- 4.10 USEFUL LINKS

