

### Duration – 10 days (Estimate)

#### 01. Introduction

- Types of Communication
- Modulation and Multiplexing
- Electromagnetic Spectrum
- Bandwidth

#### 02. Fundamentals

- Gain
- Attenuation
- Decibels

#### 03. Amplitude Modulation

- Principles
- Modulation Index
- Sidebands
- Power
- Single Sideband

#### 04. Frequency Modulation

- Principles
- Sidebands
- Modulation Index
- Noise Suppression

#### 05. Digital Techniques

- Principles
- Parallel and Serial Transmission
- Data Conversion
- Pulse Modulation
- Signal Processing

#### 06. Transmitters

- Fundamentals
- Carrier Generators
- Power Amplifiers
- Impedance Matching

## 07. Receivers

- Principles
- Superheterodyne Receivers
- Frequency Conversion
- Intermediate Frequency
- Noise

## 08. Multiplexing

- Principles
- Frequency Division Multiplexing
- Time Division Multiplexing
- Pulse Code Modulation
- Duplexing

## 09. Digital Data Transmission

- Principles
- Digital Codes
- Efficiency
- Modern Methods
- Wideband Modulation
- Broadband Modem
- Error Detection and Correction
- Protocols

## 10. Networking

- Fundamentals
- LAN Hardware
- Ethernet LANs
- Advanced Ethernet

## 11. Transmission Lines

- Fundamentals
- Standing Waves

## 12. Antennas and Wave Propagation

- Fundamentals
- Antenna Types
- Propagation

## 13. Internet

- Transmission Systems
- Storage Area Networks
- Security

## 14. Microwave Communications

- Fundamentals
- Lines and Devices
- Waveguides and Cavity Resonators
- Microwave Semiconductor Diodes
- Microwave Tubes
- Antennas

## 15. Satellite Communications

- Fundamentals
- Subsystems
- Ground Stations
- Navigation systems

## 16. Telecommunications

- Telephones
- Facsimile
- Internet Telephony

## 17. Optical Communications

- Fundamentals
- Fibre Optic Cables
- Transmitters and Receivers
- Wavelength Division Multiplexing
- Passive Optical Networks

## 18. Cell Phones

- Fundamentals
- 2G and 3G
- LTE and 4G
- Base Stations and Small Cells

## 19. Wireless Technologies

- Fundamentals
- PANs and Bluetooth
- ZigBee and Mesh
- WiMAX and Wireless Metropolitan Networks
- Infrared Wireless
- RF Identification and Near-Field Communications
- Ultrawideband Wireless

## 20. Test and Measurement

- Test Equipment
- Common Tests
- Troubleshooting
- Interference Testing

### About SyntheSys

SyntheSys provides defence systems, training, systems and software engineering and technical management services over a spectrum of different industry sectors. Along with distinct support and consultancy services, our innovative product range makes us first choice provider for both large and small organisations. Established in 1988, the company focus is on fusing technical expertise with intuitive software applications to solve common industry challenges.