

MATLAB & Simulink for RF Engineers

3-Day Intensive Course Plan (24 Hours)

Day 1: MATLAB Fundamentals for RF Signal Work

- MATLAB environment overview and interface
- Variables, vectors, matrices and matrix operations
- Scripts vs Functions, loops and conditionals
- Signal generation (sine, cosine, RF carrier)
- Time-domain and frequency-domain analysis using FFT
- Noise addition and manual SNR calculation

Day 2: Audio Signals & RF Modulation in MATLAB

- Reading and writing audio files (audioread, audiowrite)
- Audio waveform and spectrum visualization
- Manual FIR filtering using convolution
- Noise reduction techniques
- AM and FM mathematical modeling
- Demodulation and bandwidth estimation
- Using audio as baseband signal for RF simulation

Day 3: Simulink for RF Communication Systems

- Simulink interface and block diagram modeling
- Signal sources, scopes and simulation settings
- Building AM communication system in Simulink
- Channel noise modeling
- Demodulation blocks and signal observation
- Capstone project: Audio → Modulation → Channel → Demodulation → Recovery

Skills Gained After Completion

- Write MATLAB scripts and functions
- Perform FFT and spectral analysis
- Process and filter audio signals
- Simulate AM and FM systems
- Build communication models in Simulink
- Analyze RF signals in time and frequency domain