

UTTARAKHAND TECHNICAL UNIVERSITY
SESSION 2010-11
RADAR ENGINEERING - TEC-025

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Unit - I

An Introduction to Radar: Basic Radar, The Simple Form of the Radar Equation, Radar Block Diagram and Operation, Radar Frequencies, Applications of Radar.

The Radar Equation : Introduction, Prediction of Range Performance, Minimum Detectable Signal, Detection of Signals in Noise, Receiver Noise and the Signal to Noise Ratio, Probability Density Function, Introduction to Radar Cross Section of Targets and Radar clutter, Pulse, Repetition Frequency, Antenna Parameters, and Range Ambiguities.

Unit - II

CW and Frequency-Modulated Radar : The Doppler Effect, Doppler Frequency Shift, CW Radar, Frequency-modulated CW Radar

MTI and Pulse Doppler Radar: Introduction, MTI Radar with Power Amplifier, MTI Radar with Power Oscillator, Delay-Line Cancelers, Multiple, or Staggered, Pulse Repetition Frequencies, Noncoherent MTI, Pulse Doppler Radar

Tracking Radar : Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar, Tracking in Range, Acquisition,

Unit - III

Radar Antennas: Antenna Parameters, Parabolic-Reflector Antennas, Feeds for Paraboloids, Cassegrain Antenna, Polarization Twisting Cassegrain Antenna, Lens Antennas, Electronically Steered Phased Array Antenna, Beam Steering and Array Feed Networks, Phase Shifters Introduction .

Unit - IV

Receivers, Displays, and Duplexers : The Radar Receiver, Noise Figure, Mixers, Low-Noise Front-Ends, Displays, Duplexers and Receiver Protectors

Radar Transmitters : Introduction, Modulators only.

Unit - V

Detection of Radar Signals in Noise: Introduction, Matched-Filter Receiver, The Matched Filter and the Correlation Function, Correlation Detection.

Text Book

1. Merrill I., Skolnik/ Introduction to RADAR Systems / Tata Mc Graw Hill

Reference Books

1. R.S. Berkowiz/Modern Radar /John Wiley & Sons
2. Byron Edde/Radar Principles, Technology, Applications/Pearson Education