

ENG330 Radar System Applications

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

Radar systems find applications in daily living from traffic speed monitoring to inspection processing in quality assurance of goods to the safe guidance of aircraft flying in local/international airspaces, as well as for take-offs and landings from airports/airbases. This course introduces students to the fundamentals of radar principles from both a theoretical and practical perspective. Laboratory training with a scaled working analogue and digital radar system will be used to reinforce analytical modeling in seminars. Exercises using MATLAB in radar modeling will also be given as a part of the continuous assessment.

Topics:

- An introduction to radar
- MTI and Pulsed Doppler Radar
- Detection of Signals in noise
- Radar clutter
- The Radar Antenna
- Radar Receivers

Textbooks:

Merrill I. Skolnik: Introduction to Radar Systems 3rd edition McGraw-Hill, 2001
ISBN-13: 9780071181891-AA

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Learning Outcome:

- Discuss the radar equation, functions of radar antennas, transmitters and receivers and characteristics of various types of radar.
- Illustrate the operation principles of radar systems.
- Estimate the probabilities of detection and false alarm, pulse repetition frequency, transmit power, received power, observation time, range, range resolution and other radar system parameters.
- Examine the antenna parameters and system losses in radar.
- Solve radar signal detection problems.
- Plan a strategy for radar signal detection and tracking.
- Test the operations of radar using Labvolt system.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
CLASS TEST	10
CLASS TEST	10
LAB TEST	10
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**