

Course Syllabus

RADARS

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Program: Telecommunications Engineering

1. Course number and name

TELG1019 - RADARS

2. Credits and contact hours

3 credits and 3 contact hours

3. Instructor's course or coordinator's name

JUAN CARLOS AVILES CASTILLO

4. Text book, title, author, and year

- Richards, Mark A. & Scheer, James F. & William A. Holm. Principles of Modern Radar: Basic Principles (1st Edition)
 - a. Other supplemental materials
- Merrill I. Skolnik. Introduction to radar systems (Third Edition)
- Maria Sabrina Greco and Antonio De Maio. Modern Radar Detection Theory (First edition)
- Mahafza, Bassem R.. Radar systems analysis and design using MATLAB (Third Edition)

5. Specific course information

- a. Brief description of the content of the course (catalog description)

This course studies the concepts and measurements of the fundamental parameters of a radar system; including its equation for a basic understanding. It also describes the functional blocks of the radar system which encompasses the characteristics of transmitters and receivers. In addition, it is mentioned the propagation problems and external factors affecting a radar system. The course introduces the concept of radar cross section, waveform design and detection of radar signals in the presence of noise. It is studied the characteristics of "clutter", which are discussed together with the mobile target indicator (MTI) and pulse Doppler techniques to mitigate its negative effects. Finally, the radar technology is reviewed.

- b. This course is: Selected elective

6. Specific goals for the course

- a. Specific outcomes of instruction
 - 1.- To schematize the functional blocks of a radar system through its range measurement capability or main characteristics.
 - 2.- To apply the existing mathematical models for the search, tracking and detection of the target in a radar system.
 - 3.- To apply the necessary algorithms for the detection of a target in a radar system.
 - 4.- To design a radar deployment with specific characteristics that allows to achieve the requirements of the system.



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b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

7. Brief list of topics to be covered

- 1.- Introduction to radar.
- 2.- Radar range equation.
- 3.- Effects of propagation and external factors.
- 4.- Radar cross section.
- 5.- Signal and data processing.
- 6.- Radar technology.