

ENG333 RF and Microwave Design of Wireless Systems

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

Synopsis:

This course reviews some fundamental principles of high frequency RF and microwave networks. Discussion of system parameters for various components that form building blocks for a wireless receiver system. They include amplifiers, oscillators, mixers, filter and antennas. Design approaches of all the blocks will be discussed in detail. A chapter on modulation methods allows the students to understand and characterize the wireless system from an input data stream through the transmitter, antennas and propagation channel, and the receiver. After completing the course, the students should be able to design a receiver for a wireless application system and evaluate the system performance.

Topics:

- Introduction to Wireless Systems, Transmission lines
- Microwave networks, Noise analysis
- Antennas and Propagation, Filters
- Power amplifiers, Low noise amplifiers
- Mixers, Oscillators
- Modulation techniques, Receiver design

Textbooks:

D.M.Pozar: Microwave and RF Design of Wireless Systems (eTextbook) John Wiley
ISBN-13: 9781119495734

D.M.Pozar: Microwave and RF Design of Wireless Systems (eTextbook) John Wiley
ISBN-13: 9781119495734-AA

Learning Outcome:

- Determine the parameters and characteristics of transmission lines.
- Use Smith chart/ Microwave network analysis/ Noise analysis in the design of wireless systems.
- Discuss the characteristics of active devices such as mixer, amplifier, oscillator and frequency synthesiser.
- Estimate the antenna parameters.
- Calculate signal frequency, load impedance, noise figure, power, signal-to-noise ratio (SNR), and other parameters associated with wireless systems.
- Appraise the performance of various subsystems in a practical wireless receiver.
- Design impedance matching network/ amplifiers/ filters/ other systems meeting the given specifications.

Assessment Strategies:

| Continuous Assessment Component | Weightage (%) |
|--|----------------------|
| CLASS TEST | 15 |
| CLASS TEST | 15 |
| Sub-Total | 30 |

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

Weightage Total **100**