

## Course Syllabus

# HIGH FREQUENCY CIRCUITS AND MICROWAVES

Printed by: jfmoncay

Program: Telecommunications Engineering

### 1. Course number and name

TELG1012 - HIGH FREQUENCY CIRCUITS AND MICROWAVES

### 2. Credits and contact hours

3 credits and 4 contact hours

### 3. Instructor's course or coordinator's name

WASHINGTON ADOLFO MEDINA MOREIRA

### 4. Text book, title, author, and year

- Shahid, A.. Microwave engineering: Concepts and Fundamentals (Primera)
  - a. Other supplemental materials
- Medina, W. FUNDAMENTOS Y PRINCIPIOS DE LÍNEAS DE TRANSMISIÓN Y GUÍAS DE ONDAS (Primera)
- THOMASSEN, K. INTRODUCTION TO MICROWAVE FIELDS AND CIRCUITS (Primera)
- COLLIN, R. FOUNDATIONS FOR MICROWAVE ENGINEERING (Primera)
- Jhonk, C. TEORIA ELECTROMAGNETICA (Principios y Aplicaciones) (TERCERA)
- CHI HSI LI, R. RF CIRCUIT DESIGN (SEGUNDA)
- Bowick, Ch.. RF CIRCUIT DESIGN (SEGUNDA)

### 5. Specific course information

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

This course describes the behavior of electromagnetic waves that propagate at high frequencies through different media and interfaces, using circuit models and Maxwell equations. Furthermore, variations in the behavior of circuit components at high frequencies are reviewed. Finally, the ideal design of filters and their coupling to sources and loads, as well as the design of coupling circuits for high frequency amplifiers, are explored.

- b. Prerequisites

ELECTRICAL NETWORKS ANALYSIS II - ELEG1001

ELECTROMAGNETIC THEORY - ELEG1002

- c. This course is: Required

### 6. Specific goals for the course

- a. Specific outcomes of instruction

- 1.- To apply the Maxwell equations in different media to estimate the behavior of a high frequency wave.

- 2.- To argument the characteristics of power transfer in transmission lines for its application in solving installation problems.



## Course Syllabus

### HIGH FREQUENCY CIRCUITS AND MICROWAVES

Printed by: jfmoncay

Program: Telecommunications Engineering

3.- To understand the propagation of energy in waveguides for the estimation of the transmission power in its interior.

4.- To structure passive filters and amplifier coupling circuits for the transfer of maximum power to the loads.

5.- To describe the characteristics of the components of a microwave circuit, for the evaluation of their operation in the systems.

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

- An ability to apply knowledge of mathematics, science and engineering
- An understanding of ethical and professional responsibility.

#### 7. Brief list of topics to be covered

- 1.- Introduction to high frequency circuits.
- 2.- Transmission lines.
- 3.- Transmission and reflection of plane waves.
- 4.- Waveguides.
- 5.- Design of passive filters and radio frequency amplifiers.
- 6.- Components of microwave circuits.

