MEDTEC SHOOL

Course: **Basics of Circuit Theory**

Year: 2nd

Period : 1st Semester

Credits: 5

Objectives

Electric circuits (also referred to as electric networks) are ubiquitous in technology and essential t
modern engineering, from communication and computer systems aimed at processing and
transmitting information, to power systems aimed at delivng electic energy to any kind of
equipment. The forefront field of biomedical engineering with its multidisciplinary nature does not
represent an exception, since biomedical engineers are expected to understand many specialized
circuits which allow operation of sensors, instrumentation, actuators, -machine interfaces,
etc. Circuit theory is the fundamentals dipline that pervades all these applications. The goal
circuit theory is to make quantitative predictions on the electrical behavior of its, exploit foundation cours

Lectures and problem
apply knowledge to analyze the operation of linear circuits (D2):

- o the solution of resistive circuits
- o the solution of transients in first-order dynamic circuits with dc sources
- o the solution of ac steady state in dynamic circuits (phasor analysis)
- x understanding specific subjects related to applicative frameworks (D1):
  - o the ideal transformer
  - o the ideal operational amplifier and its main circuit configurations
  - o the frequency response of basic filters
  - o principles of three phase power system circuits
  - o constitutive law of non linear devices: diode, MOSFET transistor

Dublin Descriptor D1: Knowledge and understanding

Prerequisites

9- NON-LINEAR CIRCUITS

General definitions about nonlinear circuits. Diode: constitutive law, applications. Field-effect transistor (MOSFET): constitutive law, applications as small