

# Electromagnetic Metamaterials for Antenna Applications

**Date:** Tue. 29<sup>th</sup> Jan.

**Time:** 1:30 pm

**Location:** Building 59, Room 2016

## **Speaker:**

**Dr. Hussein Attia**

Assistant Professor

Electrical Engineering Department

## **Abstract:**

A metamaterial is an engineered material designed to provide a property or a behavior that is not found in nature. They are built from assemblies of multiple composite materials such as conductors or dielectrics. These materials are usually arranged in repeating patterns (i.e., lattice), at scales that are smaller than the wavelengths of the phenomena they influence. Metamaterials exhibit new fascinating properties that are different from those of their base materials. Their shape, size, and geometry can be utilized to manipulate electromagnetic waves by absorbing, blocking, enhancing, or bending waves. Thus, allowing for significant advances in the design of radiating systems. Frequency selective surfaces (FSSs) are a class of metamaterials that attracted the attention of antennas' designer over the past decade. FSS acts as an optical filter that can manipulate wave propagation over a particular band of frequency or along a certain direction(s). In this talk, different FSSs-based radiating systems will be presented to enhance the radiation characteristics of planar antennas.

## **Bio:**

Dr. Hussein Attia received his Ph.D. degree in Electrical and Computer Engineering from the University of Waterloo, Ontario, Canada in March 2011. After finishing his Ph.D., he worked as Research Engineer at the Coding and Signal Transmission Lab., University of Waterloo from March 2011 till July 2013. He was granted a post-doctoral fellowship at Concordia University, Montreal, Quebec from Aug. 2014 - Jul. 2015. Also, He was a visiting scholar at University de Quebec (INRS) from Aug.-Dec. 2015 and during June-Aug. 2017. He is currently an assistant professor at the **EE** Dept., KFUPM. His research interests include millimeter-wave high-gain and wide-band antennas, analytical techniques for electromagnetic modeling, and engineered magnetic metamaterials. Dr. Attia published 48 journal and conference papers.