

DESIGN OF SMALL ANTENNAS AND THEIR PERFORMANCE ENHANCEMENT USING EBG MATERIALS

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As antenna designers, our job is very challenging, since we are always asked to push the frontiers by developing antennas that fit in smaller and smaller spaces to cope with the perennial demand toward miniaturization of new wireless devices and sensors, with applications in WiMAX, UWB, MIMO and RFID systems. And yet, even as we strive to shrink the size of an antenna, we are asked to do so without compromising its gain, wide bandwidth and linear phase response, etc.

The course will begin by discussing some recent trends in small antenna design for some of the popular applications mentioned above. It will review a number of ongoing developments at various centers around the world engaged in the development of communication and UWB antennas as well of RFID sensors. State-of-the-art design solutions for practical applications will be presented, and practical issues such as integration of small antennas into laptops will be discussed.

Next, the course will discuss the topic of performance enhancement of antennas, including bandwidth enhancement; realization of high directivity, etc., using novel materials such as Electronic Band Gap (EBG) structures and Metamaterials, which may have single or double-negative refractive indices.