

**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN AND MANUFACTURING (IIITD&M) KANCHEEPURAM**

INTRODUCTION OF NEW COURSE

Course Title	Antenna Theory and Design	Course No (will be assigned)				
Specialization	Electronic Engineering/Communication Engineering	Structure (LTPC)	3	0	0	3
Offered for	UG/PG/Ph.D.	Status	Core		Elective <input checked="" type="checkbox"/>	
Faculty	Dr. S.S.Karthikeyan	Type	New <input checked="" type="checkbox"/>	Modification <input type="checkbox"/>		
Pre-requisite	Electromagnetic theory	To take effect from				
Submission date	Sep. 2012	Date of approval by Senate				
Objectives	<p>The objective of this course is to provide an in-depth understanding of modern antenna concepts, and practical antenna design for various applications. This course will explain the theory of different types of antennas used in communication systems. Starting from the basic antenna parameters, the course will discuss various types of antennas including the planar Microstrip antennas.</p>					
Contents of the course (With approximate break up of hours)	<p>Fundamental Concepts: Physical concept of radiation, Radiation pattern, near-and far-field regions, reciprocity, directivity and gain, effective aperture, polarization, input impedance, efficiency, Friis transmission equation, radiation integrals and auxiliary potential functions. (7)</p> <p>Radiation from Wires and Loops: Infinitesimal dipole, finite-length dipole, linear elements near conductors, dipoles for mobile communication, small circular loop. (6)</p> <p>Aperture and Reflector Antennas: Huygens' principle, radiation from rectangular and circular apertures, design considerations, Babinet's principle, Radiation from sectoral and pyramidal horns, design concepts, parabolic reflector and cassegrain antennas. (7)</p> <p>Broadband Antennas: Log-periodic and Yagi antennas, frequency independent antennas, Helical and Biconical antenna broadcast antennas.,Spiral antenna (7)</p> <p>Microstrip Antennas: Radiation mechanism, parameters and applications of microstrip antennas, feeding methods, methods of analysis, design of rectangular and circular patch antennas. Impedance matching of microstrip antenna (7)</p> <p>Antenna systems and measurements: Receiving properties of antenna, Antenna noise and temperature, Gain measurement, polarization measurement, field intensity measurement, Antenna range Introduction and concept of antenna arrays. Case study on practical microstrip patch antenna for personal wireless communications consistent with the frequencies assigned by FCC. (8)</p>					
Textbook	<ol style="list-style-type: none"> 1. C. A. Balanis, "Antenna Theory and Design", 3rd Ed., John Wiley & Sons., 2005. 2. W. L. Stutzman, and G. A. Thiele, "Antenna Theory and Design", 2nd Ed., John Wiley & Sons., 1998. 					
References	<ol style="list-style-type: none"> 1. R. E. Collin, "Antennas and Radio Wave Propagation", McGraw-Hill., 1985. 2. F. B. Gross, "Smart Antennas for Wireless Communications", McGraw-Hill., 2005 3. R. S. Elliot, "Antenna Theory and Design", Revised edition, Wiley-IEEE Press., 2003 4. J. D. Kraus and R. J. Marhefka, "Antennas for All Applications," Third Edition, 2002. 5. S. R. Saunders, "Antennas and Propagation for Wireless Communication Systems," John Wiley & Sons, 1999 					