

Short Term Course
on
‘Design and analysis of antennas in cylindrically and
spherically layered media’

17th June to 22nd June, 2019

A Continuing Education Program of Indian Institute of Technology Kharagpur



Organized by
Department of Electronics and Electrical Communication
Engineering
Indian Institute of Technology
Kharagpur – 721 302, India



'Design and analysis of antennas in cylindrically and spherically layered media'

Objective :

Design and analysis of antenna structures based on coated cylindrical and spherical structures have been in widespread use in the microwave industry including space, military and vehicular communications. Analysis of such antenna structures encompass a very different methodology compared to their planar counterparts. The cylindrical media is characterized by wave propagation in the azimuthal direction distinguishing it from planar antenna characteristics. In addition, the behavior of cylindrical waves propagating in the radial direction as opposed to planar wavefronts in rectangular configurations needs to be properly distinguished. On the other hand, the excitation of appropriate spherical harmonic modes for antennas on spherically layered medium significantly affect the coupling and radiation characteristics of such antenna structures. Together with the above, the evaluation of input impedance for both cylindrical and spherical based structures is distinctly different from planar geometries due to the treatment of collocated source and field points. In addition to the above, the course aims to address the characterization of antennas based on conical configurations. This includes antennas in the vicinity of conical structures and conical horns. It is observed that such antenna structures offer flexibility in matching, reduction of radiation cross-pol and excitation of desired modes in horn antenna structures. The course also aims to highlight current research topics in metamaterials and dielectric resonator antennas. Electromagnetic hands-on simulations for the above antenna structures would also be included as part of the course.

Course Content:

Low loss antennas and guided structures

Design and analysis of antennas in cylindrically layered medium

Design and analysis of antennas in spherically layered medium

Efficient analysis and design of conical antennas and horns

Metamaterials

Dielectric Resonator Antennas

Microwave components

Microwave transitions

Experiments:

- Use of HFSS and CST simulation tools for antenna simulation and design.
- Measurement of return loss and the radiation pattern.

Eligibility for Participation:

Teachers from Colleges / Institutions / Universities. Scientific Officers / Instructors / Technical Assistants / Research Scholars / Under Graduate and Post Graduate Students / Participants from Industries.

Course fee :

- For Students: Rs.12,000/- (including all taxes)
- For Industry: Rs. 24,000/- (including all taxes)
- For Teachers/Others: Rs. 20,000/- (including all taxes)

Accommodation & food:

Limited shared accommodation is available in the Institute guest houses VGH/NTGH (*Visveswaraya Guest House/ New Technology Guest House*) on personal payment basis. The charges are as follows: **VGH:** Daily charges: Rs.400/- (Single Occupancy) for D/B AC Rooms and Rs. 600/- (Double Occupancy) for D/B AC Rooms; Rs.250/- (Single Occupancy) for D/B Non AC Rooms and Rs.300/- (Double Occupancy) for D/B Non AC Rooms. Rs. 250/- (per bed) for dormitory bed AC and Rs. 150/- (per bed) for dormitory bed Non AC. **NTGH:** Daily charges: Rs.1000/- (Single Occupancy) for D/B AC Rooms and Rs. 1500/- (Double Occupancy) for D/B AC Rooms. On prior intimation we will try to arrange accommodation with the above charges. **Accommodation charges would have to be paid on personal payment basis. Breakfast, lunch and dinner are included in the course fee.** Course fee includes lecture notes and refreshments during the course.

How to apply:

The course fee can be paid online through IIT Kharagpur web-portal by following the steps given below (candidates applying in a group can however pay their fees offline through demand draft drawn in favour of '**CEP-STC, IIT Kharagpur**', payable at **Kharagpur**.)

- Candidates paying online should apply by clicking "**APPLY for CEP Events**" under the "**EVENTS**" section in the Institute website www.iitkgp.ac.in.
- Click on **How to Apply** at the top the page.
- Follow the instructions given there for signing up and editing your profile.
- Scroll down to the course "Short Term Training Program on '**Design and analysis of antennas in cylindrically and spherically layered media**'"
- Click on the "**Apply Now**" Button and follow point no. 6 mentioned in the instruction page available at the **How to Apply** link.

Course Coordinator
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Important dates : Last date for receiving application: June 12, 2019

Connectivity:

Kharagpur is an important railway junction and is well connected to all parts of the country by rail service (SER). Numerous local & express trains are available from Howrah. The Institute is approximately 5 Kms from the Kharagpur railway station with the bus stand adjacent to the railway station. Rickshaws (Rs. 80), auto-rickshaws (Rs. 100) and taxis (Rs.150) are available from the railway station.