

Summer FDP on Antenna Trends (01 – 05 July, 2019)

Jointly organized by: Electronics & ICT Academies at- IIT Guwahati, NIT Patna and MNIT Jaipur.

Module	Lecture	Topics	Tentative Speakers
Module 01 <i>Antenna Fundamentals and Basic Antenna Configurations</i>	Lecture 1	Radiation from short current element; Basic antenna parameters: radiation pattern, directivity, gains radiation resistance.	Prof. Ratnajit Bhattacharjee (IIT Guwahati)
	Lecture 2	Radiation from small loop; linear antennas; monopole antennas.	Dr. Mahima Arrawatia (IIT Guwahati)
	Lecture 3	Radiation from planar apertures; waveguide and horn antennas.	Dr. Soumava Mukherjee (IITJ)
Module 2 <i>Planar Antennas</i>	Lecture 4	Basic microstrip antenna elements: different feeding techniques; transmission line and cavity models.	Dr. Mahima Arrawatia (IIT Guwahati)
	Lecture 5	Broadband, multiband and compact microstrip antenna elements; PIFA (Planar Inverted F Antenna)	Prof. K. P. Ray (Defence Institute of Advanced Technology (DIAT))
Module 3 <i>Antenna Arrays and Beamforming</i>	Lecture 6	Introduction to antenna arrays, principles of pattern multiplication; uniform one - dimensional array: broadside and end-fire arrays.	Dr. Jayanta Ghosh & Dr. Rajarshi Bhattacharya (NIT Patna)
	Lecture 7	Binomial and Chebyshev arrays; Fixed beamforming networks, switched beam antennas.	Prof. Ratnajit Bhattacharjee (IIT Guwahati)
	Lecture 8	Adaptive arrays and smart antennas.	Prof. Ratnajit Bhattacharjee (IIT Guwahati)
Module 4 <i>Reflector antennas for radar and satellite communication</i>	Lecture 9	Paraboloidal reflector antennas: axisymmetric and offset, different efficiencies, calculation of radiated field (Examples from radar and satellite communication application).	Dr. Rajarshi Bhattacharya (NIT Patna)
	Lecture 10	Low cross-polarization feed (Examples from radar and satellite communication application).	Dr. S.B. Chakraborty (SAC ISRO Ahmedabad)
	Lecture 11	High gain dual reflector cassegrain antennas (Examples from radar and satellite communication application)	Prof. Ratnajit Bhattacharjee (IIT Guwahati)
Module 5 <i>Emerging trends in antenna technologies</i>	Lecture 12	Flexible and Wearable antennas	Dr. Banani Basu (NIT Silchar)
	Lecture 13	Implantable antennas and Antenna for Bio Application.	Prof. Debasis Mitra (IEST Shibpur)
	Lecture 14.1	Antennas for 5G	Prof. P.H.Rao (SAMEER Chennai)
	Lecture 14.2	Antennas for UWB	Prof. Gopi Shrikanth Reddy (IIT Mandi)
	Lecture 15	Terahertz Antenna	Dr. Jitendra Prajapati (Shiv Nadar University)

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Detailed Schedule of the Programme

*Note: Inauguration on 01st July, 2019 at 9.00 am to 09:15am.

Closing Ceremony on 05th July, 2019 from 06:15 pm onwards

*Break Timing:- Morning Tea Break : 11:00 am to 11:15 am

Lunch Break: 01:15 pm to 02:00 pm

Evening Tea Break : 04:00 pm to 04:15 pm

*Note: 1) Theory Lectures = 30 hrs

2) Hands – on/Design-oriented/activity linked/Problem

Solving/Case Studies sessions/Quiz Test = 10 hrs (approx.)

Date/Time	09:00 am to 11:00 am		11:15 am to 01:15 pm		02:00 pm to 04:00 pm	04:15 pm to 06:15 pm	
01-07-2019 Monday	09:00 am to 09:30 am	09:30 am to 11:00 am	Lecture 2 Dr. Mahima Arrawatia (IIT Guwahati)		Lecture 3 Dr. Soumava Mukherjee (IITJ)	04:15 pm to 05:15 pm	05:15 pm to 06:15 pm
	Inauguration and Introduction with all remote centers	Lecture 1 Prof. Ratnajit Bhattacharjee (IIT Guwahati)				Lecture 14.1 Prof. P.H.Rao (SAMEER Chennai)	Practical Session 01 Simulation experiments on: Dipole and loop antenna; Radiated fields from aperture antenna.
02-07-2019 Tuesday	Lecture 6 Dr. Jayanta Ghosh & Dr. Rajarshi Bhattacharya (NIT Patna)		Lecture 4 Dr. Mahima Arrawatia (IIT Guwahati)		Practical Session 02 Simulation experiments on: Rectangular and circular microstrip antenna elements, multiband planar antennas, PIFA.	04:15 pm to 05:45 pm	05:45 pm to 06:15 pm
						Practical Session 01 (Continued)	Quiz 01 (Based on Module 1 & 2)
03-07-2019 Wednesday	Lecture 7 Prof. Ratnajit Bhattacharjee (IIT Guwahati)		Lecture 8 Prof. Ratnajit Bhattacharjee (IIT Guwahati)		Lecture 12 Dr. Banani Basu (NIT Silchar)	Lecture 5 Prof. K. P. Ray (Defence Institute of Advanced Technology (DIAT))	
04-07-2019 Thursday	Lecture 9 Dr. Rajarshi Bhattacharya (NIT Patna)		Lecture 11 Prof. Ratnajit Bhattacharjee (IIT Guwahati)		Lecture 10 Dr. S.B. Chakraborty (SAC ISRO Ahmedabad)	Practical Session 03 Simulation experiments on: uniform one dimensional arrays, switched beam and adaptive antennas	
05-07-2019 Friday	Lecture 13 Prof. Debasis Mitra (IEST Shibpur)		11:30 am to 12:15 pm	12:15 pm to 01:15 pm	Lecture 15 Dr. Jitendra Prajapati (Shiv Nadar University)	04:15 pm to 05:45 pm	05:45 pm to 06:15 pm
			Quiz 02 (Based on Module 3,4 & 5)	Lecture 14.2 Prof. Gopi Shrikanth Reddy (IIT Mandi)		Practical Session 04 Simulation experiments on: Paraboloidal axisymmetric and offset reflector antenna.	Practical 05 Lab Evaluation and Manual Submission

List of Practical's for "Antenna Trends" Course

Sr. No.	List of Experiments	Sessions (2 hours session each)
1)	Simulation experiments on: Dipole and loop antenna; Radiated fields from aperture antenna.	Practical Session 01
2)	Simulation experiments on: Rectangular and circular microstrip antenna elements, multiband planar antennas, PIFA.	Practical Session 02
3)	Simulation experiments on: uniform one dimensional arrays, switched beam and adaptive antennas	Practical Session 03
4)	Simulation experiments on: Paraboloidal axisymmetric and offset reflector antenna.	Practical Session 04 (1 hour 30 minutes)
5)	Lab Exam and Manual Submission	Practical Session 05 (30 minutes)

Note: 1) Labs will follow the theory.

2) Software requirements for the course.

Octave The link is <https://www.gnu.org/software/octave/>