



# RAMCO INSTITUTE OF TECHNOLOGY

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NAAC Accredited with 'A+' Grade & An ISO 9001: 2015 Certified Institution

NBA Accredited UG Programs: CSE, EEE, ECE and MECH

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### **Value Added Course on Fundamentals of Antenna Theory, Design, and Applications-Report**

The Department of Electronics and Communication Engineering and in association with IE(I)-ECE professional Society hosted a Value Added Course on "Fundamentals of Antenna Theory, Design, and Applications" for III-year ECE students at DSP Laboratory from February 12 to 17, 2025. The training lasted 40 hours.

The resource persons for this value-added course are

1. Dr.C.Arunachala Perumal, Professor & Head/ECE;
2. Mr.D.Gopinath, AP/ECE;
3. Mrs.G.Gnanapriya, AP(SG)/ ECE;
4. Mr.R.Ramasamy, AP/ECE;
5. Ms.R.Chandralekha, AP/ECE and,
6. Mrs.R.Ramalakshmi AP(SG)/ECE.

#### **Day 1 (12.02.2025):**

The course began with course objectives and outcomes as well as an overview of Microwave frequency bands. Dr.C.Arunachala Perumal Professor & Head/ ECE taught Physical concept of radiation, Near- and far-field regions and Antenna parameters. Mr.R.Ramasamy, AP/ECE given the lecture about Impedance matching, Reflection coefficient, Return loss, VSWR, Friis transmission equation, Link budget and link margin.

After lunch break, Mr.D.Gopinath, AP/ECE handled the practical session about design flow and familiarization of ANSYS HFSS Simulation tool.

**Day 2 (13.02.2025):**

Dr.C.Arunachala Perumal Professor & Head/ ECE given the insights about Radiation Mechanisms of Linear Wire and Loop antenna. Ms.R.Chandralekha, AP/ECE explained the Horn antenna and Reflector antennas - Design considerations and applications.

After lunch break, Mr.R.Ramasamy, AP/ECE handled the practical session about design and analysis of Dipole antenna in ANSYS HFSS Simulation tool.

**Day 3 (14.02.2025):**

Mrs.G.Gnana Priya, AP(SG)/ECE given the lecture about Microstrip antennas and Log periodic antennas - Design considerations and applications.

Mr.R.Ramasamy, AP/ECE and prepared the Quiz for the assessments. It has 30 objective type questions. Each carry one mark. After the tea break, Ms.R.Chandralekha, AP/ECE shared the Quiz through Google form to the students. She asked the students to take the quiz during that session and students' assessments are recorded.

After lunch break, Mr.D.Gopinath, AP/ECE handled the practical session about design Microstrip patch antenna and study the antenna parameters in ANSYS HFSS Simulation tool.

**Day 4 (15.02.2025):**

In the first session, Dr.C.Arunachala Perumal, Professor &Head/ECE given lecture about Two-element array, Array factor, Pattern multiplication, Uniformly spaced arrays with uniform excitation amplitudes.

After the tea break, he continued the lecture about uniformly spaced arrays with non-uniform excitation amplitudes, Yagi array, Phased array, Smart antennas.

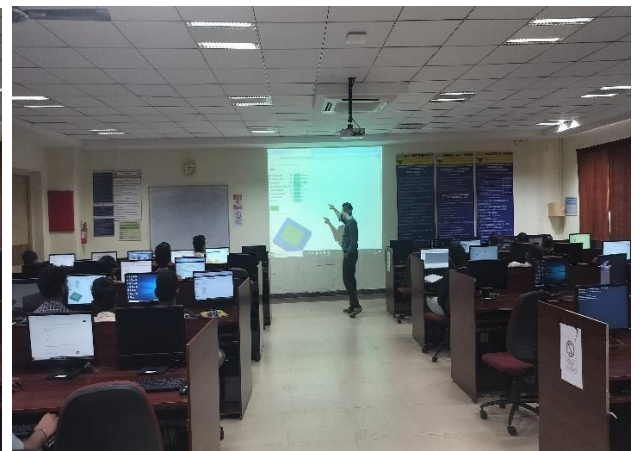
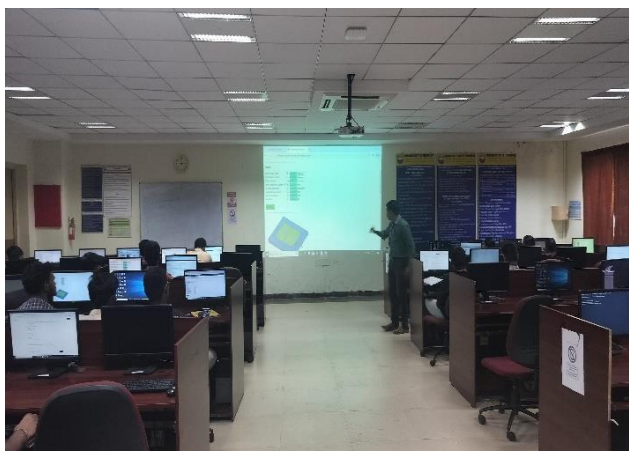
After lunch break, Mr.R.Ramasamy, AP/ECE handled the practical session about design and analysis of Slot antenna in ANSYS HFSS Simulation tool.

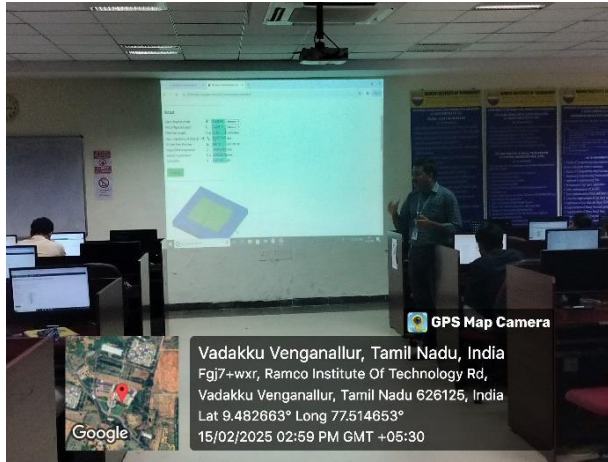
**Day 5 (17.02.2025):**

In the last day, the student groups are formed and asked to design antennas for specific applications. They are asked to analyze and optimize the antenna parameters using ANSYS HFSS Simulation tool. They are asked to prepare the report and present the outputs. The mini project session was monitored by Mr.D.Gopinath, AP/ECE and Mrs.G.Gnana Priya, AP(SG)/ECE.

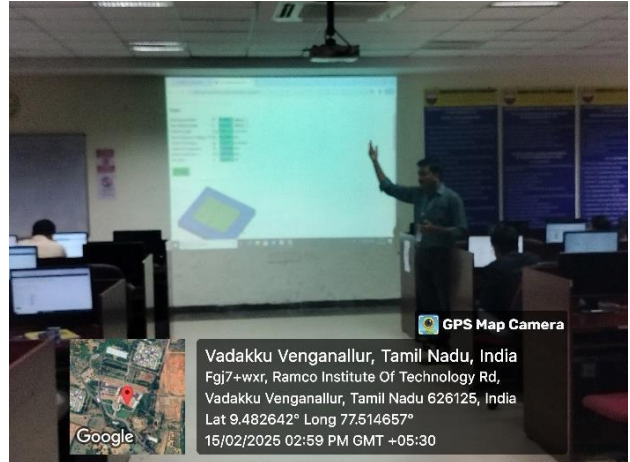
From this value-added course, students learned the fundamentals of antenna theory, design, and applications. Eventually, they have learned the design flow and familiarization of ANSYS HFSS Simulation tool. They have designed and analyzed the Dipole antenna, Micro-strip patch antenna, and Slot antenna. The quiz was undertaken to measure the students' learning. Students' feedback on the course was also collected. Some of the Value added course glimpses are attached below.

### **VAC-Glimpses**





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