



### Electronics & Telecommunication Engineering

Academic Year – 2022-2023	Class: Third Year
Semester – 1	Date : 7/11/2022
CO: 6	PO: 1,2,3,5,9,10

#### Innovative Teaching Methods- Experimental Learning

**Title of Innovation method/activity:** Antenna Designing using 4nec2 Simulation Software

**1. Name of Faculty:** Dr. Ulhas Patil

**2. Subject:** Electromagnetic Field Theory

#### 3. Objective of Method:

1. Students are able to design and implement dipole and Yagi-Uda antenna for different frequency.
2. Observe the radiation pattern, check the response SWR Vs K, Impedance and phase Vs operating frequency and comment on smith chart

#### 4. Topic Covered through Activity:

Dipole and Yagi- Uda Antenna design using simulation software 4nec2

#### 5. Description of method with Benefits (8 – 10 lines) :

Simulation example is given to show the radiation pattern of the designed antenna. In this example, Dipole and yagi-uda antenna is designed and simulate for different frequencies.

Linear wire antennas and Yagi-Uda array antennas are very popular in the field of telecommunication and are widely used now-a-days. In many RF applications it is required to get the desired antenna parameters for better communication. We can easily design any linear wire antennas or Yagi-Uda antenna using “4NEC2” software and simulate various parameters using it . 4NEC2 is one of the most popular antenna design and simulation software. The term NEC stands for “Numerical Electromagnetic Code”. It is a very simple and widely used software for designing and analysing now a days.



## **Roles and Responsibilities**

- **Teacher**
  - Provide the Introduction to all the topic.
  - Aware the student about the length, Breadth, Depth of Topic
  - Provide the Study Material and appropriate guide lines at every stage
  - Remain available all the time during all stages of process.
  - Prepare assessment methodology.
- **Student**
  - Go through all the material provided on particular topic
  - Once topic assigned understand and gain expertise on topic through collaboration.
  - Actively participate individually and contribute by means of discussion, hand-out
  - Share the expertise topic when joins a new group.

## **6. Assessment Tools & Rubrics :**

- **Experimental Result (20%)**
  - Individual experimental result would be checked by teacher as per result
- **Quiz (40 %)**
  - Individual performance would be checked through the quiz.
- **One Page Report / Hand out (40 %)**
  - Individual performance would be checked by teacher according to the rubrics.
- **Overall Individual Performance**
- Final Marks Obtained =  $(0.2 * \text{Expt. Result} + 0.4 * \text{Quiz Marks} + 0.4 * \text{Report Marks})$
- **Rubrics for Assessment of One Page Report / Hand out**
  - Topic Content (60 %)
  - Report (40 %)



Criteria	3- High	2- Moderate	1- Slight
Topic Content	Highly Relevant	Moderately Relevant	Slightly Relevant
References	Highly Relevant	Moderately Relevant	No / Wrong References
Presentation and Writing Skill	Neat , Clean & Grammatically Correct	Neat & clean	Poorly Written



### 7. Evaluation Sheet

Sn	Name of Student (Individual )	Experimental Result using 4nec2 (5)	Quiz (10)	Report (10)	Final Marks
1	Aditya Murai	5	4	10	19
2	Ahire Abhishek Panditrao	5	5	10	20
3	Ahire Minakshi Ramdas	4	6	10	20
4	Amrutkar Om Prakash	4	4	10	18
5	Bawdhankar Yugant Rakesh	3	5	10	18
6	Bhamare Riya Sachin	5	6	10	21
7	Bhamare Sumit Jagdish	5	3	10	18
8	Khule Sahil Dinkar	3	4	10	17
9	Bhosale Viraj Mahendra	5	5	10	20
10	Chaudhari Om Madan	5	9	10	24
11	Chaudhari Sneha Manoj	5	9	10	24
12	Dashpute Anuja Sandeep	5	3	10	18
13	Deore Nilesh Dattu	5	4	10	19
14	Divate Siddhesh Rajendra	5	4	10	19
15	Duse Nupur Vijay	5	7	10	22
16	Gahivade Mayuri Pramod	5	2	10	17
17	Gangurde Namrata Shantaram	Left			
18	Gangurde Tejas Dilip	5	7	10	22
19	Gharte Sakshi Dnyaneshwar	5	9	10	24
20	Gojare Jyoti Navnath	4	7	10	21
21	Gosavi Shraddha Dattatray	5	6	10	21
22	Jadhav Jay Uttam	5	4	10	19
23	Jagtap Ritesh Mahendra	4	7	10	21
24	Jahdav Monika Jayesh	5	4	10	19
25	Jawale Bhagyesh Pradip	4	1	10	15
26	Kachole Omkar Swapnil	5	1	10	16
27	Kad Roshan Bhausahab	3	2	10	15
28	Kapadi Kunal Pandit	3	5	10	18
29	Kasar Sharvari Bhagyesh	3	4	10	17



30	Khan Farhan Tufail	3	5	10	18
31	Khole Aakanksha Changdeo	4	4	10	18
32	Magar Aarti Milind	5	2	10	17
33	Medha Sandip Bankar	4	3	10	17
34	Mohit Pravin Chaudhari	5	3	10	18
35	Muthal Shubham Popat	5	6	10	21
36	Ozha Ankita Shivpujan	5	8	10	23
37	Pachpute Garima Rupesh	4	6	10	20
38	Patil Kalyani Jagdish	5	4	10	19
39	Patil Manish Yashwant	3	4	10	17
40	Patil Pranav Prabhakar	4	3	10	17
41	Pawar Nikhil Sanjay	4	5	10	19
42	Porje Shubhangi Madhukar	4	4	10	18
43	Pratik Rao Deshmukh	3	5	10	18
44	Rane Pratik Rajendra	4	8	10	22
45	Sadgir Siddhant Bajirao	4	7	10	21
46	Sakshi Sanjay Musale	5	7	10	22
47	Salekar Samiksha Sunil	5	3	10	18
48	Salunke Pranav Shantaram	5	8	10	23
49	Samruddhi Anil Wadgaonkar	5	8	10	23
50	Shinde Aayush Kiran	5	7	10	22
51	Shinde Geeta Sandeep	5	1	10	16
52	Shirsat Yash Sandeep	5	3	10	18
53	Sonawane Saurabh Anil	5	4	10	19
54	Tejas Anil Bhosale	5	6	10	21
55	Ugale Vaishnavi Bhausaheb	5	7	10	22
56	Wadje Vedant Ramesh	5	6	10	21
57	Zinjurde Pratik Nanasaheb	5	5	10	20
58	Chaudhari Rachita Durgadas	5	6	10	21
59	Sonwane Vaishnavi Devendra	5	6	10	21
60	Dhondge Pooja Bhausaheb	5	2	10	17
61	Thete Pooja Gokul	5	4	10	19



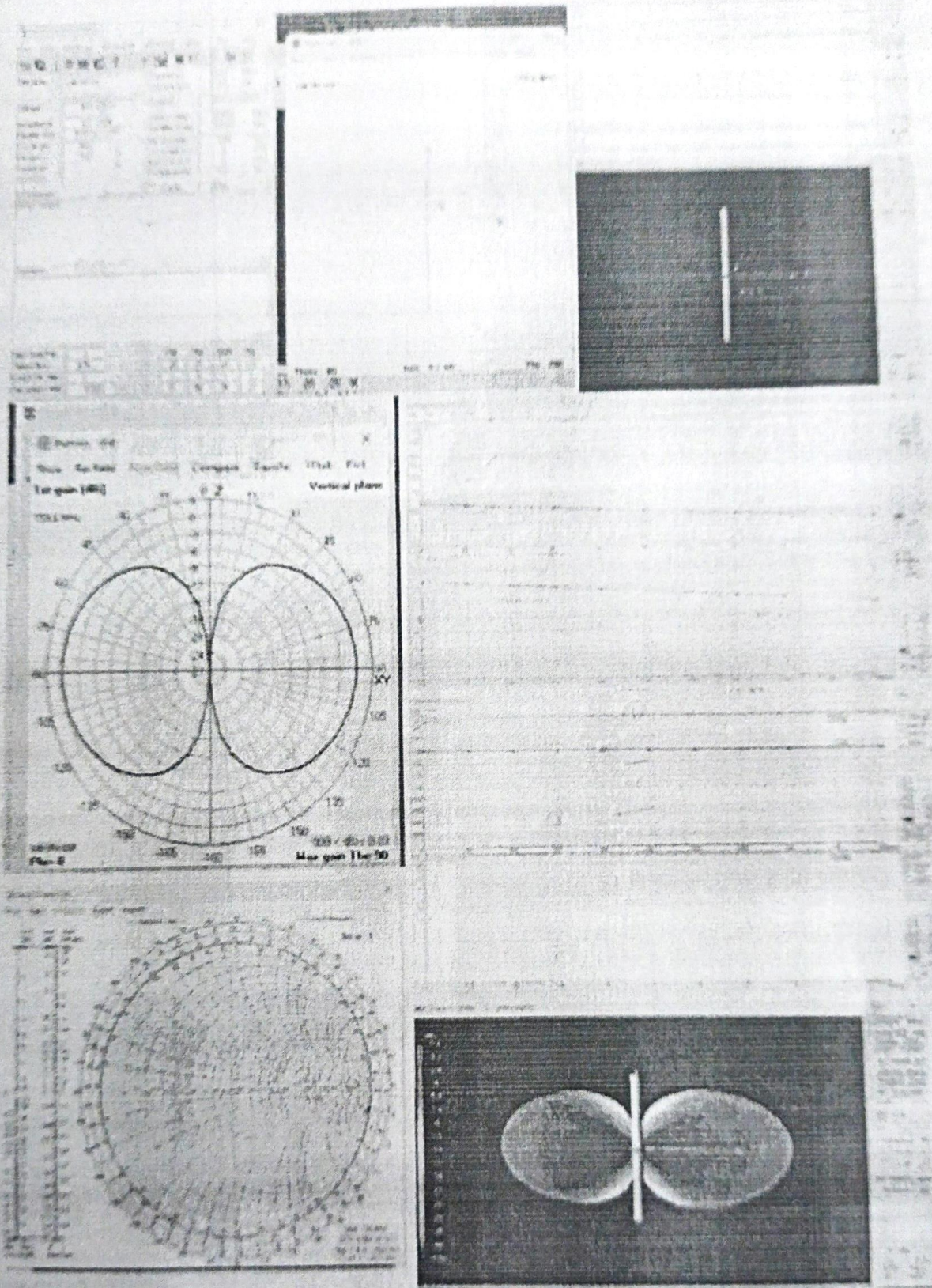
62	Bhamare Tanvi Manoj	5	5	10	20
63	Goyekar Pravin Bhagwan	5	4	10	19
64	Thete Tejshree Ajit	5	9	10	24
65	Vidhate Sanjana Shashikant	5	4	10	19
66	Sonawane Snehal Balasaheb	5	5	10	20
67	Pagar Tanuja Sharad	5	3	10	18
68	Chavan Arun Prakash	5	3	10	18
69	Kapadnis Prerana Bhausahab	5	8	10	23
70	Ahire Sarika Bandu	5	6	10	21
71	Nikam Rutuja Subhash	5	6	10	21
72	Sonawane Aditya Kanhaiyalal	5	4	10	19
73	Deshmukh Raj Sudhir	5	3	10	18
74	Dhabale Rushikesh Rajendra	4	5	10	19
75	Shinde Udayan Sachin	5	6	10	21
76	Shinde Mansi Madhukar	5	4	10	19

### 8. Impact Analysis

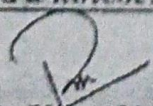
SN	3- High	2- Moderate	2- Slight
<b>Do you find Methodology Helpful</b>	<b>81.33%</b>	<b>18.66</b>	-
<b>Does this helps for building a good team</b>	<b>76%</b>	<b>24%</b>	-
<b>Does the content covered are relevant</b>	<b>80%</b>	<b>20%</b>	-
<b>Would you like to participate in activity again</b>	<b>76</b>	-	-

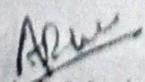


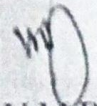
### 9. Activity Picture (Radiation Pattern and Smith chart)



10. For review and critique contact: e-mail address of faculty and HOD  
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