

## ANTENNA DESIGN & ANALYSIS LAB

<b>Course Code</b>	<b>20EC3652</b>	<b>Year</b>	III	<b>Semester</b>	II
<b>Course Category</b>	Program Core	<b>Branch</b>	ECE	<b>Course Type</b>	Lab
<b>Credits</b>	3	<b>L-T-P</b>	0-0-3	<b>Prerequisites</b>	EMF &W, AA&S
<b>Continuous Internal Evaluation:</b>	15	<b>Semester End Evaluation</b>	35	<b>Total Marks</b>	50

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<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	Utilize simulation software tools for antenna design L3
<b>CO2</b>	Model and simulate various antennas for different frequency ranges. L3
<b>CO3</b>	Measure the radiation characteristics of the antennas L5
<b>CO4</b>	Analyse the radiation characteristics of antenna arrays-L4
<b>CO5</b>	Make an effective report of the experiments

### Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation    2-Medium correlation    3-Strong correlation

\* - Average value indicates course correlation strength with mapped PO

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>CO1</b>	3				3								3	3
<b>CO2</b>	3				3								3	3
<b>CO3</b>				1	1		1						1	1
<b>CO4</b>		1			1		1						1	1
<b>CO5</b>										3				
Average (Rounded to nearest integer)	3	1		1			1			3			3	3

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<b>Syllabus</b>		
S.No.	Experimental Topics	Mapped CO
1	Introduction to antenna simulation software tools	CO1, CO5
2	Design and analysis of wire antennas (Dipoles, Monopoles, Loop antennas, Yagi-Uda antenna etc.)	CO1, CO2, CO4, CO5
3	Design and analysis of wideband antennas (Conical & Bow-Tie antennas)	CO1, CO2, CO4, CO5
4	Design and analysis of microstrip antennas (Rectangular, circular and other patch shapes)	CO1, CO2, CO4, CO5
5	Measurement of radiation characteristics of Antennas	CO3, CO5
6	Analysis of Linear Antenna Arrays	CO1, CO4, CO5

❖ A Minimum of TEN experiments covering all the above topics need to be conducted

## Learning Resources

### Text Books

1. Constantine A. Balanis - Antenna Theory and Applications – John Wiley & Sons, 4<sup>th</sup> Ed., 2021
2. J.D Kraus, R. J. Marhefka & A.S.Khan - Antennas and Wave Propagation –TMH, 4<sup>th</sup> Ed., 2010.

### Reference Books

1. E.C. Jordan and K.G. Balmain - Electromagnetic Waves and Radiating Systems – PHI, 2<sup>nd</sup> Ed., 2009.
2. K.D. Prasad, Satya Prakashan - Antennas and Wave Propagation – Tech India Publications, New Delhi, 2001
3. E.V.D. Glazier and H.R.L. Lamont - Transmission and propagation-, vol.5 Standard Publishers Distributors- New Delhi

### e- Resources & other digital material

1. <http://anlage.umd.edu/HFSSv10UserGuide.pdf>
2. <https://www.youtube.com/watch?v=kUDICVOPlvY>