

Bhoj Reddy Engineering College for Women: Hyderabad
Department of Electronics and Communication Engineering
Lesson plan of faculty member for the academic year 2017–18

Class: III B Tech

Branch-Section: ECE-B

Semester: I

Subject: Antenna and Wave Propagation

Lectures per week: 4+1 (Tutorial)

| Lecture Number | Topics to be covered | Date (s) |
|--|---|-------------------------------|
| UNIT – I: Antenna Basics | | |
| 1 | Introduction, Basic Antenna Parameters | 12 July 2017 |
| 2 | Radiation Patterns, Beam Area | 13 July 2017 |
| 3 | Radiation Intensity , Beam Efficiency | 15 July 2017 |
| 4 | Tutorial (G3,G2)) - Problems related to Antenna Parameters | 13,14 July 2017 |
| 5 | Directivity, Gain and Resolution | 18 July 2017 |
| 6 | Antenna Apertures, Effective Height | 19 July 2017 |
| 7 | Fields from oscillating dipole | 20 July 2017 |
| 8 | Field zones, Antenna Temperature, Front-to-back ratio | 22 July 2017 |
| 9 | Tutorial (G1, G3, G2) - Problems related to Antenna Parameters | 17,20,21 July 2017 |
| 10 | Antenna theorems | 25 July 2017 |
| 11 | Radiation, Retarded potentials | 26 July 2017 |
| 12 | Helmholtz theorem. | 27 July 2017 |
| 13 | Radiation from Small Electric Dipole, Quarter wave Monopole | 29 July 2017 |
| 14 | Tutorial (G1, G3, G2) - Problems related to Antenna Parameters | 24,27,28 July 2017 |
| 15 | Half wave Dipole – Current Distributions, Evaluation of Field Components | 1 August 2017 |
| 16 | Radiated power, Radiation Resistance ,Directivity, Beam Width | 2 August 2017 |
| 17 | Effective Area and height, Natural current distributions, field patterns of Thin Linear Center-fed antennas | 3 August 2017 |
| 18 | Loop Antennas : Small Loops | 5 August 2017 |
| 19 | Tutorial (G1, G3, G2) - Problems related to monopole and dipole | 31 July,3,4 August 2017 |
| 20 | Field Components, Comparison of a small loop and short dipole | 8 August 2017 |
| 21 | Concept of short magnetic dipole, D and R _r relations for small loops | 9 August 2017 |
| 22 | large loop Antennas | 10 August 2017 |
| UNIT-II: VHF,UHF and Microwave antennas-I | | |
| 23 | Arrays with Parasitic Elements, Yagi Uda array | 12 August 2017 |
| 24 | Tutorial (G1, G3, G2) - Problems related to Loop Antennas | 7,10,11 August 2017 |
| 25 | Folded dipole and their characteristics | 16 August 2017 |
| 26 | Helical Antennas, Significance, Geometry | 17 August 2017 |
| 27 | Helix modes | 19 August 2017 |
| 28 | Tutorial (G3, G2) - Problems related to Yagi-Uda, Helical Antennas | 17,18 August 2017 |
| 29 | Practical design considerations for monofilar helical in Axial mode and Normal modes | 22 August 2017 |
| 30 | Horn antennas-types | 23 August 2017 |
| 31 | Fermat's principle, Optimum Horns | 24 August 2017 |
| 32 | Design considerations of Pyramidal Horns, | 26 August 2017 |
| 33 | Tutorial (G1, G3) - Problems related to Horn Antennas | 21,24 August 2017 |
| UNIT-III: VHF,UHF and Microwave antennas-II | | |
| 34 | Introduction to Microstrip Antennas | 29 August 2017 |
| 35 | Features, advantages, limitations | 30 August 2017 |
| 36 | Rectangular patch antennas-features, Impact of different parameters on characteristics | 31 August 2017 |
| 37 | Tutorial (G1, G3, G2) - Problems related to Microstrip Antennas | 28,31 August,1 September 2017 |

| Lecture Number | Topics to be covered | Date (s) |
|--------------------------------------|--|------------------------------|
| 38 | Reflector Antennas : Flat Sheet and Corner Reflectors | 5 September 2017 |
| 39 | Paraboloidal reflectors-geometry | 9 September 2017 |
| 40 | Tutorial (G1, G3, G2) - Problems related to Microstrip Antennas | 4,7 September 2017 |
| 41 | Patterns, Characteristics, Feed methods | 12 September 2017 |
| 42 | Reflector types | 13 September 2017 |
| 43 | Lens antennas, Geometry, Features | 14 September 2017 |
| 44 | Non metallic dielectric lenses | 16 September 2017 |
| 45 | Tutorial (G1, G3, G2) - Problems related to Reflector Antennas | 11,14,15 September 2017 |
| 46 | Zoning, Applications | 19 September 2017 |
| UNIT-IV: Antenna Arrays | | |
| 47 | Point sources-definition, patterns | 21 September 2017 |
| 48 | Arrays of 2 Isotropic sources-different cases, | 23 September 2017 |
| 49 | Tutorial (G1, G3, G2) - Problems related to Lens Antennas | 18,21,22 September 2017 |
| 50 | Principles of pattern multiplication | 3 October 2017 |
| 51 | Broadside, Endfire arrays | 4 October 2017 |
| 52 | Derivation of Characteristics, Comparison, EFA with Increased Directivity | 5 October 2017 |
| 53 | BSA with non uniform amplitude distributions, General considerations and binomial arrays | 7 October 2017 |
| 54 | Tutorial (G3, G2) - Problems related to Array Antennas | 5,6 October 2017 |
| 55 | Antenna measurements arrangements, Reciprocity, Near and far fields | 10 October 2017 |
| 56 | Coordinate system, Source of errors, Patterns to be measured | 11 October 2017 |
| 57 | Pattern measurements, Directivity and Gain Measurements | 12 October 2017 |
| UNIT-V: Wave propagation-I,II | | |
| 58 | Definitions, Categorizations and General classifications | 14 October 2017 |
| 59 | Tutorial (G1, G3, G2) Problems related to EFA, BFA and antenna measurements | 9,12,13 October 2017 |
| 60 | Different modes of wave propagation, Ray/Mode concepts. | 17 October 2017 |
| 61 | Ground Wave Propagation, Wave Tilt, Curved Earth Reflections | 19 October 2017 |
| 62 | Space wave propagation, Field strength variation with distance and height | 21 October 2017 |
| 63 | Tutorial (G1, G3, G2) Problems related to Ground wave Prop. | 16,19,20 October 2017 |
| 64 | plane earth reflections, Space and Surface waves | 24 October 2017 |
| 65 | Effect of earth's curvature, Absorption, Super refraction | 25 October 2017 |
| 66 | Duct propagation, Scattering phenomenon, M-curves, | 26 October 2017 |
| 67 | Tropospheric propagation, fading and path loss calculations | 28 October 2017 |
| 68 | Tutorial (G1, G3, G2) - Problems related to Surface wave Prop. | 23,26,27 October 2017 |
| 69 | Sky wave propagation , structure of Ionosphere, Ray path, Critical frequency | 31 October 2017 |
| 70 | MUF, LUF,OWF, Multihop communication, | 1 November 2017 |
| 71 | Virtual height, Relation between MUF and skip distance | 2 November 2017 |
| 72 | Tutorial (G1, G3, G2) - Problems related to Sky wave Propagation | 30 October,2,3 November 2017 |
| 73 | Previous papers discussion | 7 November 2017 |
| 74 | Tutorial (G1, G3, G2) - Problems related to Sky wave Propagation | 6 November 2017 |

Text books:

1. J.D.Kraus,R.J.Marhefka and Ahmad S.Khan, TMH,4/e,2010
2. E.C.Jordan and K.G.Balmain,Electromagnetic radiating systems, PHI ,2/e, 2000

Name and signature of the faculty: Ms S Prashanthi----

Name and signature of Head of the Department: Ms N Shribala ----