

## Lesson Plan

**Name of Faculty:** Ajay Kumar

**Discipline:** Electronics & Comm. Egg.

**Semester:** 4th

**Subject:** CS

**Lesson Plan Duration:** 16 weeks

**Work load (Lecture /Practical) per week (in Hours):** Lectures—03, Practical—03

| Week            | Theory      |                                                                                                                                                          | Practical     |                                                                                                       |
|-----------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------|
|                 | Lecture Day | Topic (Including Assignment/ Test)                                                                                                                       | Practical Day | Topic                                                                                                 |
| 1 <sup>st</sup> | 1           | Classification of transmitters on the basis of modulation, service                                                                                       | 1             | Introduction to Communication lab                                                                     |
|                 | 2           | Classification of transmitters on the basis of frequency and power                                                                                       |               |                                                                                                       |
|                 | 3           | Block diagram of AM transmitters and working of each stage                                                                                               |               |                                                                                                       |
| 2 <sup>nd</sup> | 4           | Block diagram and working principles of reactance FET                                                                                                    | 2             | To observe the waveforms at different stages of a AM transmitter                                      |
|                 | 5           | Block diagram and working principles of Armstrong FM transmitters                                                                                        |               |                                                                                                       |
|                 | 6           | Assignment                                                                                                                                               |               |                                                                                                       |
| 3 <sup>rd</sup> | 7           | Principle and working with block diagram of super heterodyne AM receiver, Function of each block and typical waveforms at input and output of each block | 3             | To observe the waveforms at different stages of a Radio Receiver                                      |
|                 | 8           | Performance characteristics of a radio receiver: sensitivity, selectivity, fidelity, S/N ratio                                                           |               |                                                                                                       |
|                 | 9           | Image rejection ratio and their measurement procedure                                                                                                    |               |                                                                                                       |
| 4 <sup>th</sup> | 10          | ISI standards on radio receivers (brief idea), Selection criteria for intermediate frequency (IF)                                                        | 4             | To align AM broadcast radio receiver                                                                  |
|                 | 11          | Concepts of simple and delayed AGC                                                                                                                       |               |                                                                                                       |
|                 | 12          | Block diagram of an FM receiver, function of each block and waveforms at input and output of different blocks                                            |               |                                                                                                       |
| 5 <sup>th</sup> | 13          | Need for limiting and de-emphasis in FM reception                                                                                                        | 5             | To identify and study the various types of antennas used in different frequency ranges.               |
|                 | 14          | Block diagram of communication receivers,                                                                                                                |               |                                                                                                       |
|                 | 15          | Differences with respect to broadcast receivers                                                                                                          |               |                                                                                                       |
| 6 <sup>th</sup> | 16          | Assignment                                                                                                                                               | 6             | To plot the radiation pattern of a directional and omni directional antenna                           |
|                 | 17          | Electromagnetic spectrum and its various ranges: VLF, LF, MF, HF, VHF, UHF, Microwave                                                                    |               |                                                                                                       |
|                 | 18          | Physical concept of radiation of electromagnetic energy from a dipole.                                                                                   |               |                                                                                                       |
| 7 <sup>th</sup> | 19          | Concept of polarization of EM Waves                                                                                                                      | 7             | To plot the variation of field strength of a radiated wave, with distance from a transmitting antenna |
|                 | 20          | Definition and physical concepts of the terms used with antennas like point source                                                                       |               |                                                                                                       |
|                 | 21          | Gain directivity, aperture, effective area, radiation pattern                                                                                            |               |                                                                                                       |
| 8 <sup>th</sup> | 22          | Beam width and radiation resistance, loss resistance.                                                                                                    | 8             | To study and rectify different faults in a broadcast radio receiver.                                  |
|                 | 23          | Types of antennas-brief description, characteristics and typical applications of half wave dipole                                                        |               |                                                                                                       |
|                 | 24          | Medium wave (mast) antenna, folded dipole,                                                                                                               |               |                                                                                                       |

|                  |    |                                                                                            |    |                                                                                                       |
|------------------|----|--------------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------------------------|
| 9 <sup>th</sup>  | 25 | Patch, loop Antenna                                                                        | 09 | To observe the waveforms at different stages of a AM transmitter                                      |
|                  | 26 | Ferrite rod, Yagi antenna                                                                  |    |                                                                                                       |
|                  | 27 | Structure, Characteristics and typical applications of dish antenna                        |    |                                                                                                       |
| 10 <sup>th</sup> | 28 | Assignment                                                                                 | 10 | To observe the waveforms at different stages of a Radio Receiver                                      |
|                  | 29 | Basic idea about different modes of wave propagation and typical areas of application      |    |                                                                                                       |
|                  | 30 | Ground wave propagation and its characteristics, summer field equation for field strength. |    |                                                                                                       |
| 11 <sup>th</sup> | 31 | Space wave communication – line of sight propagation, standard atmosphere                  | 11 | To align AM broadcast radio receiver                                                                  |
|                  | 32 | concept of effective earth radius range of space wave propagation standard atmosphere      |    |                                                                                                       |
|                  | 33 | Duct propagation, sky wave propagation                                                     |    |                                                                                                       |
| 12 <sup>th</sup> | 34 | Ionosphere and its layers.                                                                 | 12 | To identify and study the various types of antennas used in different frequency ranges.               |
|                  | 35 | Explanation of terms - virtual height, critical frequency, skip distance,                  |    |                                                                                                       |
|                  | 36 | Maximum usable frequency, multiple hop propagation.                                        |    |                                                                                                       |
| 13 <sup>th</sup> | 37 | Assignment                                                                                 | 13 | To plot the radiation pattern of a directional and omni directional antenna                           |
|                  | 38 | Class Test                                                                                 |    |                                                                                                       |
|                  | 39 | Basic idea about satellite communication                                                   |    |                                                                                                       |
| 14 <sup>th</sup> | 40 | Passive and active satellites                                                              | 14 | To plot the variation of field strength of a radiated wave, with distance from a transmitting antenna |
|                  | 41 | Meaning of the terms; orbit, apogee, perigee                                               |    |                                                                                                       |
|                  | 42 | Geo-stationary satellite and its need                                                      |    |                                                                                                       |
| 15 <sup>th</sup> | 43 | Block diagram and explanation of a satellite communication link.                           | 15 | To study and rectify different faults in a broadcast radio receiver.                                  |
|                  | 44 | Introduction to VSAT                                                                       |    |                                                                                                       |
|                  | 45 | VSAT and its features                                                                      |    |                                                                                                       |
| 16 <sup>th</sup> | 46 | Assignment                                                                                 | 16 | Revision                                                                                              |
|                  | 47 | Class test                                                                                 |    |                                                                                                       |
|                  | 48 | Revision                                                                                   |    |                                                                                                       |