**LESSON PLAN**

**NAME OF THE FACULTY: - Sh. Bhupinder Kumar**

**DISIPLANE: - ECE**

**SAMESTER:- 6th**

**SUBJECT— Microwave & Radar**

**Lesson Plan Duration:- 15 weeks**

**Work Load (Lecture/Practical) per week (In hours): Lecture 03, Practical -03**

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| --- | --- | --- |
| Week | Theory | Practical |
|  | **Lecture Day** | **Topic (Including assignment/test)**  | **Practical** | **Topic** |
|  |  |  |  |
| 1st | 1st | Introduction to microwaves and its applications, | 1st | To measure electronics and mechanical tuning range of a reflex klystron |
| 2nd | Classification on the basis of its frequency bands |
| 3rd | (HF, VHF, UHF, L, S, C, X, KU, KA, mm, SUB, mm) |
| 2nd | 4th | Rectangular and circular wave guides and their applications. | 2nd | To measure VSWR of a given load. |
| 5th | Mode of waveguide |
| 6th | Propagation constant of a rectangular wave guide, cut off wavelength,guide  |
| 3rd  | 7th | wavelength and their relationship with free space wavelength (nomathematical derivation). | 3rd | To measure the Klystron frequency by slotted section method |
| 8th | Impossibility of TEM mode in a wave guide |
| 9th | Constructional features, characteristics and application of tees |
| 4th  | 10th | bends, matchedtermination, | 4th | To measure the directivity and coupling of a directional coupler. |
| 11th | twists, detector, mount, slotted section, |
|  | 12th | directional coupler, fixed and variable attenuator |
| 5th | 13th | directional coupler, fixed and variable attenuator | 5th | To plot radiation pattern of a horn antenna in horizontal and vertical planes. |
| 14th | coaxial to wave guideadapter. |
| 15th | Basic concepts of thermionic emission and vacuum tubes |
| 6th | 16th | Effects of interelectrode capacitance, Lead Inductance | 6th | Toverify the properties of magic tee. |
| 17th | Transit time on the high frequencyperformance of conventional vacuum tubes |
| 18th | steps to extend their high frequency operations. |
| 7th  | 19th | Construction, characteristics,operating principles and typical applications of thefollowing devices (No mathematical treatment) Multi cavity klystron | 7th  |  |
| 20th | Reflex klystronMulti cavity magnetronTraveling wave tube |
| 21 | Gunn diode andImpatt diode |
| 8th  | 22 | Microwave antennAs Structure characteristics and typical applications | 8th  |  |
| 23 | Horn and Dish antennas |
| 24 | Microwave Communication systems |
| 9th  | 25 | Block diagram and working principles of microwave communication link. | 9th |  |
| 26 | Application of Microwave  |
| 27 | Introduction to Propagation |
| 10th  | 28 | Troposcatter Communication  |  |  |
| 29 | Troposphere and its properties, |  |  |
| 30 | Tropospheric duct formation and propagation, |  |  |
| 11th  | 31 | Troposcatter propagation. |  |  |
| 32 | Introduction to radar, its various applications, |  |  |
| 33 | Radar range equation (no derivation) and its applications. |  |  |
| 12th  | 34 | Block diagram and operating principles of basic pulse radar. |  |  |
| 35 | Concepts ofambiguous range |  |  |
| 36 | Radar area of crosssection and its dependence onfrequency |  |  |
| 13th  | 37 | Block diagram and operating principles of CW  |  |  |
| 38 | Doppler Effect  |  |  |
| 39 | FMCW radars,and their applications |  |  |
| 14th  | 40 | Block diagram and operating of Radar |  |  |
| 41 | principles of MTI radar |  |  |
| 42 | Radar displayPPI |  |  |
| 15th  | 43 | Introduction to VSAT  |  |  |
| 44 | transponders multiple access techniques |  |  |
| 45 | VSAT and itsfeatures |  |  |

**Teacher Name Bhupinder Kumar**