* 1. **MICROWAVE AND RADAR ENGINEERING Faculty: Sh. Bhupinder**

|  |  |  |
| --- | --- | --- |
| **Week** | **Theory Topic** | **Experiment** |
| **1st** | Introduction to microwaves and its applications | To measure electronics and mechanical tuning range of a reflex klystron |
| **2nd** | Classification on the basis of its frequency bands |
| **3rd** | Construction, characteristics, operating principles and applications ofMulti cavity klystron Reflex klystron |
| **4th** | Construction, characteristics, operating principles and applications of Multi-cavity magnetronTraveling wave tube |
| **5th** | Construction, characteristics, operating principlesand applications of Gunn diode and Impatt diode |
| **6th** | Rectangular and circular wave guides and their applications. Mode of wave guide | To measure VSWR of a given load. |
| **7th** | Propagation constant of a rectangular wave guide, cut off wavelength, guide wavelength and theirrelationship with free space wavelength |
| **8th** | Impossibility of TEM mode in a wave guide |
| **9th** | Constructional features, characteristics and application of tees, bends, matched termination,twists |
| **10th** | Constructional features, characteristics andapplication of detector, mount, slotted section, directional coupler, fixed and variable attenuator |
| **11th** | Constructional features, characteristics and application of isolator, circulator and duplex,coaxial to wave guide adapter, horn antenna | To measure the Klystron frequency by slottedsection method |
| **12th** | Block diagram and working principles of microwave communication link.Troposcatter Communication-basic idea | To measure the directivityand coupling of a directional coupler. |
| **13th** | Introduction to radar, its various applications, radar range equation (no derivation) and its applications.Block diagram and operating principles of basicpulse radar | To plot radiation pattern of a horn antenna in horizontal and vertical planes |
| **14th** | Concepts of ambiguous range, radar area of cross- section and its dependence on frequency.Block diagram and operating principles of CW (Doppler) and FMCW radars, and theirapplications. | To verify the properties of magic tee. |
| **15th** | Block diagram and operating principles of MTI radar.Radar display- PPI |
| **16th** | Inroduction to VSAT |

* 1. **WIRELESS AND MOBILE COMMUNICATION**

Faculty: Ms. Anshu Bhalla

|  |  |  |
| --- | --- | --- |
| **Week** | **Theory Topic** | **Experiment** |
| **1st** | Basics Advantages of wireless communication Electromagnetic waves.Frequency Spectrum used |  |
| **2nd** | Cellular Network Systems. Propagation considerations Range ,Atmospheric Effect, Geographic Effect, Fading,Doppler Effect, Multipath Effect |  |
| **3rd** | Introduction to 1G and 2G Cell area, Cell Site Structure | Study the features,specification and working of cellular mobile |
| **4th** | Capacity of cellFrequency Reuse (Concept) ,Interference (Co- channel, Adjacent channel)Power Control for reducing Interference | Measurement of signal strength at various points from a transmittingantenna |
| **5th** | Fundamentals of cellular network planning Coverage planningCapacity planning,Cell splitting and sectoring | Demonstration of Base Trans Receiver(BTS) with nearby cellular tower |
| **6th** | Multiple Access Techniques for Wireless Communication Introduction to Multiple Access.Frequency Division Multiple Access | Observing call processing of GSM trainer kit. |
| **7th** | Time Division Multiple Access (TDMA) Distinction between TDMA FDD and TDMA TDDCode Division Multiple Access (CDMA), WCDMA |
| **8th** | Introduction of Global Systems for Mobile Communication (GSM) and itsarchitecture |
| **9th** | Introduction of CDMA System, comparison ofCDMA and GSM Systems |
| **10th** | Introduction of GPRS, EDGE, Bluetooth and Wi-fi. |
| **11th** | Introduction to Architecture and Features of UMTSHSPA ( High Speed Packet Access ) | Visit to Mobile Switching Centre |
| **12th** | Features and Architecture of LTE (Long TermEvolution) |
| **13th** | Assembling and dissembling of GSM phone | Repair of a GSM mobile phone |
| **14th** | Study parts of Mobile Phone |
| **15th** | Testing of various parts |

* 1. **ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT**

Faculty: Ms. Seema

|  |  |
| --- | --- |
| **Week** | **Theory Topic** |
| **1st** | Entrepreneur Concept /Meaning and its needQualities and functions of entrepreneur and barriers in entrepreneurship |
| **2nd** | Sole proprietorship and partnership forms and other forms of business organisationsSchemes of assistance by entrepreneurial support agencies at National, State, District –level, organisation: NSIC, NRDC, DC, MSME, SIDBI, NABARD, NIESBUD, HARDICON Ltd.,Commercial Banks, SFC’s TCO, KVIB, DIC, Technology BusinessIncubators (TBI) and Science and Technology Entrepreneur Parks |
| **3rd** | Scanning of the business environmentSalient features of National and Haryana State industrial policies and resultant business opportunitiesTypes and conduct of market survey |
| **4th** | Assessment of demand and supply in potential areas of growth Identifying business opportunityConsiderations in product selectionConverting an idea into a business opportunity |
| **5th** | Preliminary project reportDetailed project report including technical, economic and market feasibilityCommon errors in project report preparations Exercises on preparation of project reportSample project report |
| **6th** | Definitions and importance of managementFunctions of management: Importance and process of planning, organising, staffing, directing and controllingPrinciples of management (Henri Fayol, F.W. Taylor) Concept and structure of an organisationTypes of industrial organisations and their advantagesLine organisation, staff organisation Line and staff organisationFunctional Organisation |
| **7th** | Leadership* Definition and Need
* Qualities and functions of a leader
* Manager Vs leader
* Types of leadership
* Case studies of great leaders Motivation
 |

|  |  |
| --- | --- |
|  | * Definition and characteristics
* Importance of self motivation
* Factors affecting motivation
* Theories of motivation (Maslow, Herzberg, Douglas, McGregor)
 |
| **8th** | Human Resource Management* Introduction and objective
* Introduction to Man power planning, recruitment and selection
* Introduction to performance appraisal methods Material and Store Management
* Introduction functions, and objectives
* ABC Analysis and EOQ
 |
| **9th** | Marketing and sales* Introduction, importance, and its functions
* Physical distribution
* Introduction to promotion mix
* Sales promotion Financial Management
* Introductions, importance and its functions
* knowledge of income tax, sales tax, excise duty, custom duty, VAT, GST
 |
| **10th** | Introduction and importance of Healthy Work Culture in organization Components of CultureImportance of attitude, values and behaviorBehavioural Science – Individual and group behavior. |
| **11th** | Professional ethics – Concept and need of Professional Ethics and human values.Meaning and definition of accounting.Double entry system of book keeping |
| **12th** | Trading account, PLA account and balance sheet of a company Objectives of Financial ManagementProfit Maximization v/s Wealth Maximization |
| **13th** | Total Quality Management (TQM)* Statistical process control
* Total employees Involvement
* Just in time (JIT)
 |
| **14th** | Intellectual Property Right (IPR)* Introduction, definition and its importance
* Infringement related to patents, copy right, trade mark
 |
| **15th** | Revision and doubts |