SSB REGIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY,CHITRADA,MAYURBHANJ

THEORY LESSON PLAN

BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	SESSION:2024-25(WINTER)	SEMESTER:5th
NAME OF FACULTY:	SUBJECT:(TH-1) Entrepreneurship and Management & SmartTechnology	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS= 04	DATE OF SEMESTER STARTING 01/07/2024	DATE OF SEMESTER CLOSING
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE=04	TOTAL NOS OF WORKING DAYS AS PER SCTE&VT:	

SL.NO	CHAPTER	NAME OF THE TOPIC	AS PER SYLLABUS NUMBER OF CLASSES ALLOTED	AS PER PLAN NO. OF CLASSES REQUIRED TO COMPLETE	DETAILS CONTENTS OF THIS CHAPTER
1	1	Entrepreneurship	10	10	•Concept /Meaning of Entrepreneurship •Need of Entrepreneurship •Characteristics, Qualities and Types of entrepreneur, Functions •Barriers in entrepreneurship •Entrepreneurs vrs. Manager •Forms of Business Ownership: Sole proprietorship, partnership forms and others •Types of Industries, Concept of Start-ups •Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC,SIDBI, NABARD, Commercial Banks, KVIC etc. •Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks
2	2	Market Survey and Opportunity Identification (Business Planning)	8	8	•Business Planning •SSI, Ancillary Units, Tiny Units, Service sector Units •Time schedule Plan, Agencies to be contacted for Project Implementation •Assessment of Demand and supply and Potential areas of Growth •Identifying Business Opportunity •Final Product selection
3	3	Project report Preparation	4	4	•Preliminary project report •Detailed project report, Techno economic Feasibility •Project Viability

4	4	Management Principles	5	5	•Definitions of management •Principles of management •Functions of management (planning, organising, staffing, directing and controlling etc.) •Level of Management in an Organisation
5	5	Functional Areas of Management	10	10	a) Production management •Functions, Activities •Productivity •Quality control •Production Planning and control b) Inventory Management •Need for Inventory management •Models/Techniques of Inventory management c) Financial Management •Functions of Financial management •Management of Working capital •Costing (only concept) •Break even Analysis •Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Concepts) d) Marketing Management •Concept of Marketing and Marketing Management •Marketing Techniques (only concepts) •Concept of 4P s (Price, Place, Product, Promotion) e) Human Resource Management •Functions of Personnel Management •Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
6	6	Leadership and Motivation	6	6	a) Leadership •Definition and Need/Importance •Qualities and functions of a leader •Manager Vs Leader •Style of Leadership (Autocratic, Democratic, Participative) b) Motivation •Definition and characteristics •Importance of motivation •Factors affecting motivation •Theories of motivation (Maslow) •Methods of Improving Motivation •Importance of Communication in Business •Types and Barriers of Communication

7	7	Work Culture, TQM & Safety	5	5	•Human relationship and Performance in Organization •Relations with Peers, Superiors and Subordinates •TQM concepts: Quality Policy, Quality Management, Quality system •Accidents and Safety, Cause, preventive measures, General Safety Rules , Personal Protection Equipment(PPE)
8	8	Legislation	6	6	a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights b) Features of Factories Act 1948 with Amendment (only salient points) c) Features of Payment of Wages Act 1936 (only salient points)
9	9	Smart Technology	6	6	•Concept of IOT, How IOT works •Components of IOT, Characteristics of IOT, Categories of IOT •Applications of IOT- Smart Cities, Smart Transportation, Smart Home, Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Management etc.

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THEORY LESSON PLAN					
BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.				SESSION:2024-25(WINTER)	SEMESTER:5TH
NAME OF FACULTY:ILIMA MOHANTA				SUBJECT: (Th-2)VLSI & EMBEDDED SYSTEM	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS=04				DATE OF SEMESTER STARTING 01/07/2024	DATE OF SEMESTER CLOSING
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE=04				TOTAL NOS OF WORKING DAYS AS PER SCTE&VT:	
SL.NO	CHAPTER	NAME OF THE TOPIC	AS PER SYLLABUS NUMBER OF CLASSES ALLOTED	AS PER PLAN NO. OF CLASSES REQUIRED TO COMPLETE	DETAILS CONTENTS OF THIS CHAPTER
1	1	Introduction to VLSI & MOS Transistor	12	12	1.1 Historical perspective- Introduction 1.2 Classification of CMOS digital circuit types 1.3 Introduction to MOS Transistor& Basic operation of MOSFET. 1.4 Structure and operation of MOSFET (n-MOS enhancement type) & COMS 1.5 MOSFET V-I characteristics, 1.6 Working of MOSFET capacitances. 1.7 Modelling of MOS Transistors including Basic concept the SPICE level-1 models, the level-2 and level-3 model. 1.8 Flow Circuit design procedures 1.9 VLSI Design Flow & Y chart 1.10 Design Hierarchy 1.11 VLSI design styles-FPGA, Gate Array Design, Standard cells based, Full custom
2	2	Fabrication of MOSFET	10	10	2.1 Simplified process sequence for fabrication 2.2 Basic steps in Fabrication processes Flow 2.3 Fabrication process of nMOS Transistor 2.4 CMOS n-well Fabrication Process Flow 2.5 MOS Fabrication process by n-well on p-substrate 2.6 CMOS Fabrication process by P-well on n-substrate 2.7 Layout Design rules 2.8 Stick Diagrams of CMOS inverter
3	3	MOS Inverter	9	9	3.1 Basic nMOS inverters, 3.2 Working of Resistive-load Inverter 3.3 Inverter with n-Type MOSFET Load – Enhancement Load, Depletion n-MOS Inverter 3.4 CMOS Inverter – circuit operation and characteristics and Interconnect effects: Delay time definitions 3.5 CMOS Inventor design with delay constraints – Two sample mask lay out for p-type substrate.

4	4	Static Combinational, Sequential, Dynamics logic circuits & Memories	15	15	4.1 Define Static Combinational logic ,working of Static CMOS logic circuits (Two-input NAND Gate) 4.2 CMOS logic circuits (NAND2 Gate) 4.3 CMOS Transmission Gates(Pass gate) 4.4 Complex Logic Circuits - Basics 4.5 Classification of Logic circuits based on their temporal behaviour 4.6 SR Flip latch Circuit, 4.7 Clocked SR latch only. 4.8 CMOS D latch. 4.9 Basic principles of Dynamic Pass Transistor Circuits 4.10 Dynamic RAM, SRAM, 4.11 Flash memory
5	5	System Design method & synthesis	4	4	5.1 Design Language (SPL & HDL)& HDL & EDA tools & VHDL and packages Xlinx 5.2 Design strategies & concept of FPGA with standard cell based design 5.3 VHDL for design synthesis using CPLD or FPGA 5.4 Raspberry Pi - Basic idea
6	6	Introduction to Embedded Systems	10	10	6.1 Embedded Systems Overview,list of embedded systems,characteristics ,example – A Digital Camera 6.2 Embedded Systems Technologies--Technology – Definition -Technology for Embedded Systems -Processor Technology -IC Technology 6.3 Design Technology-Processor Technology,General Purpose Processors – Software, Basic Architecture of Single Purpose Processors – Hardware 6.4 Application – Specific Processors,Microcontrollers,Digital Signal Processors(DSP) 6.5 IC Technology- Full Custom / VLSI,Semi-Custom ASIC (Gate Array & Standard Cell), PLD (Programmable Logic Device) 6.6 Basic idea of Arduino micro controller

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THEORY LESSON PLAN

BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	SESSION:2024-25(WINTER)	SEMESTER:5TH
NAME OF FACULTY:TAPAS KUMAR NAYAK	SUBJECT:(TH-3)ANALOG & DIGITAL COMMUNICATION	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS=05	DATE OF SEMESTER STARTING 01/07/2024	DATE OF SEMESTER CLOSING
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE=05	TOTAL NOS OF WORKING DAYS AS PER SCTE&VT:	

SL.NO	CHAPTER	NAME OF THE TOPIC	AS PER SYLLABUS NUMBER OF CLASSES ALLOTED	AS PER PLAN NO. OF CLASSES REQUIRED TO COMPLETE	DETAILS CONTENTS OF THIS CHAPTER
1	1	Elements of Communication Systems	10	10	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram 1.2 Source of information & Communication Channels. 1.3 Classification of Communication systems (Line & Wireless or Radio) 1.4 Modulation Process, Need of modulation and classify modulation process 1.5 Analog and Digital Signals & its conversion. 1.6 Basic concept of Signals & Signals classification (Analog and Digital) 1.7 Bandwidth limitation
2	2	Amplitude (linear) Modulation System	15	15	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index. 2.2 Generation of Amplitude Modulation(AM)- Linear level AM modulation only 2.3 Demodulation of AM waves (liner diode detector, square law detector & PLL) 2.4 Explain SSB signal and DSBSC signal 2.5 Methods of generating & detection SSB-SC signal (Indirect method only) 2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection) 2.7 Concept of Balanced modulators 2.8 Vestigial Side Band Modulation
3	3	Angle Modulation Systems	10	10	3.1 Concept of Angle modulation & its types (PM & FM) 3.2 Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal. 3.3 Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal 3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram 3.5 Compare between AM and FM modulation (Advantages & Disadvantages) 3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram 3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram

4	4	AM & FM TRANSMITTER & RECEIVER	8	8	4.1 Classification of Radio Receivers 4.2 Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure 4.3 AM transmitter - working principle with Block Diagram 4.4 Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio 4.5 Working of super heterodyne radio receiver with Block diagram 4.6 Working of FM Transmitter & Receiver with Block Diagram.
5	5	ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM	17	17	5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing 5.2 Sampling Techniques (Instantaneous, Natural, Flat Top) 5.3 Analog Pulse Modulation - Generation and detection of PAM, PWM & PPM system with the help of Block diagram & comparison of all above. 5.4 Concept of Quantization of signal & Quantization error. 5.5 Generation & Demodulation of PCM system with Block diagram & its applications. 5.6 Companding in PCM & Vocoder 5.7 Time Division Multiplexing & explain the operation with circuit diagram. 5.8 Generation & demodulation of Delta modulation with Block diagram. 5.9 Generation & demodulation of DPCM with Block diagram. 5.10 Comparison between PCM, DM , ADM & DPCM
6	6	DIGITALMODULATION TECHNIQUES	15	15	6.1 Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver) & Digital modulation formats. 6.2 Advantages of digital communication system over Analog system 6.3 Digital modulation techniques & types. 6.4 Generation and Detection of binary ASK, FSK, PSK, QPSK, QAM, MSK, GMSK. 6.5 Working of T1-Carrier system. 6.6 Spread Spectrum & its applications 6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS). 6.8 Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems) 6.9 Application of Different Modulation Schemes. 6.10 Types of Modem & its Application

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BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	SESSION:2024-25(WINTER)	SEMESTER:5TH
NAME OF FACULTY:SK MINAZ KADERI	SUBJECT: (TH-4)WAVE PROPAGATION & BROADBAND COMMUNICATION ENGINEERING	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS=04	DATE OF SEMESTER STARTING 01/07/2024	DATE OF SEMESTER CLOSING
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE=04	TOTAL NOS OF WORKING DAYS AS PER SCTE&VT:	

SL.NO	CHAPTER	NAME OF THE TOPIC	AS PER SYLLABUS NUMBER OF CLASSES ALLOTED	AS PER PLAN NO. OF CLASSES REQUIRED TO COMPLETE	DETAILS CONTENTS OF THIS CHAPTER
1	1	WAVE PROPAGATION & ANTENNA	12	12	1.1 Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only) 1.2 Classification based on Modes of Propagation-Ground wave, Ionosphere ,Sky wave propagation, Space wave propagation 1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height 1.4 Radiation mechanism of an antenna-Maxwell equation. 1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern 1.6 Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna 1.7 Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only b) UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna 1.8 Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
2	2	TRANSMISSION LINES	10	10	2.1 Fundamentals of transmission line. 2.2 Equivalent circuit of transmission line & RF equivalent circuit 2.3 Characteristics impedance, methods of calculations & simple numerical. 2.4 Losses in transmission line. 2.5 Standing wave – SWR, VSWR, Reflection coefficient, simple numerical. 2.6 Quarter wave & half wavelength line 2.7 Impedance matching & Stubs – single & double 2.8 Primary & secondary constant of X-mission line.

3	3	TELEVISION ENGINEERING.	13	13	3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses 3.2 TV Transmitter – Block diagram & function of each block. 3.3 Monochrome TV Receiver -Block diagram & function of each block. 3.4 Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals). 3.5 Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels, Digital Light Processing (DLP),Liquid Crystal Display (LCD),Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application 3.6 Discuss the principle of operation - LCD display, Large Screen Display. 3.7 CATV systems & Types & networks 3.8 Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
4	4	MICROWAVE ENGINEERING.	15	15	4.1 Define Microwave Wave Guides. 4.2 Operation of rectangular wave gives and its advantage. 4.3 Propagation of EM wave through wave guide with TE & TM modes. 4.4 Circular wave guide. 4.5 Operational Cavity resonator. 4.6 Working of Directional coupler, Isolators & Circulator. 4.7 Microwave tubes-Principle of operational of two Cavity Klystron. 4.8 Principle of Operations of Travelling Wave Tubes 4.9 Principle of Operations of Cyclotron 4.10 Principle of Operations of Tunnel Diode & Gunn diode
5	5	Broadband communication	10	10	5.1 Broadband communication system-Fundamental of Components and Network architecture 5.2 Cable broadband data network- architecture, importance & future of broadband telecommunication internet based network. 5.3 SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages 5.4 ISDN - ISDN Devices interfaces, services, Architecture, applications, 5.5 BISDN -interfaces & Terminals, protocol architecture applications

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BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	SESSION:2024-25(WINTER)	SEMESTER:5TH
NAME OF FACULTY:BASTA HANSDAH	SUBJECT: (TH-5)POWER ELECTRONICS AND PLC	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS=04	DATE OF SEMESTER STARTING 01/07/2024	DATE OF SEMESTER CLOSING
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE=04	TOTAL NOS OF WORKING DAYS AS PER SCTE&VT:	

SL.NO	CHAPTER	NAME OF THE TOPIC	AS PER SYLLABUS NUMBER OF CLASSES ALLOTED	AS PER PLAN NO. OF CLASSES REQUIRED TO COMPLETE	DETAILS CONTENTS OF THIS CHAPTER
1	1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	18	18	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT 1.2 Two transistor analogy of SCR. 1.3 Gate characteristics of SCR. 1.4 Switching characteristic of SCR during turn on and turn off. 1.5 Turn on methods of SCR. 1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation 1.6.2 Resonant pulse commutation 1.7 Voltage and Current ratings of SCR. 1.8 Protection of SCR 1.8.1 Over voltage protection. 1.8.2 Over current protection 1.8.3 Gate protection 1.9 Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits 1.9.3 R-C firing circuit 1.9.4 UJT pulse trigger circuit 1.9.5 Synchronous triggering (Ramp Triggering) 1.10 Design of Snubber Circuits

2	2	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.	12	12	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter 2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads. 2.3 Understand need of freewheeling diode. 2.4 Working of single phase fully controlled converter with resistive and R- L loads. 2.5 Working of three-phase half wave controlled converter with Resistive load 2.6 Working of three phase fully controlled converter with resistive load. 2.7 Working of single phase AC regulator. 2.8 Working principle of step up & step down chopper. 2.9 Control modes of chopper 2.10 Operation of chopper in all four quadrants.
3	3	UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS	8	8	3.1 Classify inverters. 3.2 Explain the working of series inverter. 3.3 Explain the working of parallel inverter 3.4 Explain the working of single-phase bridge inverter. 3.5 Explain the basic principle of Cyclo-converter. 3.6 Explain the working of single-phase step up & step down Cyclo-converter. 3.7 Applications of Cyclo-converter.
4	4	UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS	10	10	4.1 List applications of power electronic circuits. 4.2 List the factors affecting the speed of DC Motors. 4.3 Speed control for DC Shunt motor using converter. 4.4 Speed control for DC Shunt motor using chopper. 4.5 List the factors affecting speed of the AC Motors. 4.6 Speed control of Induction Motor by using AC voltage regulator. 4.7 Speed control of induction motor by using converters and inverters (V/F control). 4.8 Working of UPS with block diagram. 4.9 Battery charger circuit using SCR with the help of a diagram. 4.10 Basic Switched mode power supply (SMPS) - explain its working & applications

5	5	PLC AND ITS APPLICATIONS	12	12	5.1 Broadband communication system-Fundamental of 5.1 Introduction of Programmable Logic Controller(PLC) 5.2 Advantages of PLC 5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC. 5.4 Applications of PLC 5.5 Ladder diagram 5.6 Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v)branching 5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate. 5.8 Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT 5.9 Timers-i)T ON ii) T OFF and iii)Retentive timer 5.10 Counters-CTU, CTD 5.11 Ladder diagrams using Timers and counters 5.12 PLC Instruction set 5.13 Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller 5.14 Special control systems- Basics DCS & SCADA systems 5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)

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