SSB REGIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY,CHITRADA,MAYURBHANJ

LESSON PLAN

BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	SESSION:SUMMER-2023	SEMESTER:6TH
NAME OF FACULTY: TAPAS KUMAR NAYAK	SUBJECT: ADVANCE COMMUNICATION ENGINEERING (TH-1)	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS= 5	DATE OF SEMESTER STARTING 14-02-2023	DATE OF SEMESTER CLOSING 23-05-2023
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE= 5	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	RADAR & NAVIGATION AIDS	10	10	1.1 Basic Radar, advantages & applications 1.2 Working principle of Simple Radar system , its types 1.3 Radar range equation &Performance factor of radar. 1.4 Working principle of Pulsed Radar system. 1.5 Function of radar indication and Working principle of moving targetindicator. 1.6 Define Doppler effect&Working principle of C.WRadar. 1.7 Radar aids to Navigation 1.8 MTI Radar- working principle 1.8 Aircraft landing system. 1.9 Navigation Satellite System.(NAVSAT) & GPS System
2	2	SATELLITE COMMUNICATION	15	15	2.1 Basic Satellite Transponder & Kepler's Laws 2.2 Satellite Orbital patterns and elevation(LEO,MEO & GEO) categories 2.3 Concept of Geostationary Satellite, calculate its height, velocity & round trip time delay & their advantage & disadvantage 2.4 Working of the Satellite sub system 2.5 Satellite frequency allocation and frequency bands. 2.6 General structure of satellite Link system (Uplink, Down link,Transponder, Crosslink) 2.7 Working principle of direct broadcast system (DBS) 2.8 Working principle of VSAT system. 2.9 Define multiple accessing & name various types. 2.10 Time Division Multiple Accessing(TDMA) & Code Division Multiple Accessing (CDMA) – block diagram, its advantages & dis-advantages. 2.11 Satellite Application- Communication Satellite(MSAT), Digital SatelliteRadio. 2.12 Working principle of GPS Receiver & Transmitter& applications. 2.13 Optical Satellite Link transmitter & Receiver

3	3	OPTICAL FIBER COMMUNICATION	15	15	3.1 Basic principle of Optical communication. 3.2 Compare the advantage and disadvantage of optical fibres&metalliccables 3.3 Electromagnetic Frequency and wave line spectrum 3.4 Types of optical fibres&principles of propogation in a fibre using RayTheory 3.5 Optical fiber construction 3.6 Define terms: Velocity of propagation, Critical angle, Acceptance anglenumericalaperture 3.7 Optical fibre communication system- block diagram & working principle 3.8 Modes of propagation and index profile of optical fiber 3.9 Types optical fiber configuration: Single-mode step index, Multi-modestep index, Multi-mode Graded index 3.10 Attenuation in optical fibers – Absorption losses, scattering, losses,bending losses, core and cladding losses- Dispersion – materialDispersion, waveguide dispersion, Intermodal dispersion 3.11 Optical sources(Transmitter) & types – LED-semiconductor laser diodes 3.12 LASER -its working principles, block diagram using laser feedbackcontrol circuit 3.13 Optical detectors – PIN and APD diodes &Blockdiagram usingAPDConnectors and splices –Optical cables - Couplers 3.14 Optical repeater & Single Channel system 3.15 Applications of optical fibres – civil, Industry and Military application 3.16 Concept of Wave Length Division Multiplexing (WDM)
4	4	TELECOMMUNICATION SYSTEM	10	10	4.1 Working of Electronic Telephone System. (Telephone Set) 4.2 Function of switching system.& Call procedures 4.3 Space and time switching. 4.4 Numbering plan of telephone networks (National Schemes & International Numbering) 4.5 Working principle of a PBX & Digital EPABX. 4.6 Units of Power Measurement. 4.7 Working principle of Internet Protocol Telephone 4.8 Working principle of Internet Telephone
5	5	Data Communication	10	10	5.1 Basic concept of Data Communication 5.2 Architecture, Protocols and Standards 5.3 Data Communication Circuits 5.4 Types of Transmission & Transmission Modes 5.5 Data Communication codes 5.6 Basic idea of Error control & Error Detection 5.7 MODEM & its basic block diagram& common features Voice Band Modem

6	6	WIRELESS COMMUNICATION	15	15	6.1 Basic concept of Cell Phone,frequency reuse channel assignment strategic handoff co-channel Interference and system capacity of a Cellular Radiosystems. 6.2 Concept of improving coverage and capacity in cellular system (Cell Splitting,Sectoring) 6.3 Wireless Systems and its Standards. 6.4 Discuss the GSM (Global System for Mobile) service and features. 6.5 Architecture of GSM system & GSM mobile station &channel types of GSMsystem. 6.6 working of forward and reveres CDMA channel,the frequency and channelspecifications 6.7 Architecture and features of GPRS. 6.8 Discuss the mobile TCP, IP protocol. 6.9 Working of Wireless Application Protocol (WAP). 6.10 Features of SMS, MMS, 1G,2G, 3G, 4G& 5G Wireless network. 6.11 Smart Phone and discuss its features indicate through Block diagram.

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LESSON PLAN						
BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.					SESSION:SUMMER-2023	SEMESTER:6TH
NAME OF FACULTY:SK MINAZ KADERI					SUBJECT: CONTROL SYSTEMS & COMPONENT (TH-2)	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS= 4					DATE OF SEMESTER STARTING 14-02-2023	DATE OF SEMESTER CLOSING 23-05-2023
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE= 4					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	FUNDAMENTAL OF CONTROL SYSTEM	5	5	1.1 Classification of Control system 1.2 Open loop system & Closed loop system and its comparison 1.3 Effects of Feed back 1.4 Standard test Signals(Step, Ramp, Parabolic, Impulse Functions) 1.5 Servomechanism 1.6 Regulators (Regulating systems)	
2	2	TRANSFER FUNCTIONS	8	8	2.1 Transfer Function of a system & Impulse response, 2.2 Properties,Advantages& Disadvantages of Transfer Function 2.3 Poles & Zeroes of transfer Function 2.4 Representation of poles & Zero on the s-plane 2.5 Simple problems of transfer function of network	
3	3	CONTROL SYSTEM COMPONENTS & MATHEMATICAL	5	5	3.1 Components of Control System 3.2 Potentiometer, Synchros, Diode modulator & demodulator , 3.3 DC motors, AC Servomotors 3.4 Modelling of Electrical Systems(R, L, C, Analogous systems)	
4	4	BLOCK DIAGRAM & SIGNAL FLOW GRAPHS(SFG)	8	8	4.1 Definition of Basic Elements of a Block Diagram 4.2 Canonical Form of Closed loop Systems 4.3 Rules for Block diagram Reduction 4.4 Procedure for of Reduction of Block Diagram 4.5 Simple Problem for equivalent transfer function 4.6 Basic Definition in SFG & properties 4.7 Mason's Gain formula 4.8 Steps foe solving Signal flow Graph 4.9 Simple problems in Signal flow graph for network	

5	5	TIME DOMAIN ANALYSIS OF CONTROL SYSTEMS	8	8	5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy, In-sensitivity and robustness. 5.2 System Time Response 5.3 Analysis of Steady State Error 5.4 Types of Input & Steady state Error(Step ,Ramp, Parabolic) 5.5 Parameters of first order system & second-order systems 5.6 Derivation of time response Specification (Delay time, Rise time, Peak time,Setting time,Peak over shoot)
6	6	FEEDBACK CHARACTERISTICS OF CONTROL SYSTEMS	6	6	6.1 Effect of parameter variation in Open loop System & Closed loop Systems 6.2 Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative 6.3 Effect of feedback on overall gain, Stability 6.4 Realisation of Controllers(P, PI,PD,PID) with OPAMP
7	7	STABILITY CONCEPT, & ROOT LOCUS METHOD	8	8	7.1 Effect of location of poles on stability 7.2 RouthHurwitz stability criterion. 7.3 Steps for Root locus method 7.4 Root locus method of design(Simple problem)
8	8	FREQUENCY-RESPONSE ANALYSIS & BODE PLOT	7	7	8.1 Frequencyresponse,Relationship between time & frequency response 8.2 Methods of Frequency response 8.3 Polar plots & steps for polar plot 8.4 Bodes plot & steps for Bode plots 8.5 Stability in frequency domain, Gain Margin& Phase margin 8.6 Nyquist plots. Nyquiststability criterion. 8.7 Simple problems as above
9	9	STATE VARIABLE ANALYSIS	5	5	9.1 Concepts of state, state variable, state model, 9.2 state modelsfor linear continuous time functions(Simple)

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LESSON PLAN

BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	**SESSION:SUMMER-2023**	**SEMESTER: 6TH**
NAME OF FACULTY: RUTUPARNA MOHALIK	**SUBJECT: DIGITAL SIGNAL PROCESSING** (TH-3)	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS= 4	**DATE OF SEMESTER STARTING** 14-02-2023	**DATE OF SEMESTER CLOSING** 23-05-2023
NO OF CLASSES/WEEK GIVEN AS PER TIME TABLE= 4	**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 of Signals, Systems & Signal processing	10	10	1.1 Basics of Signals, Systems & Signal processing- basic elementof a digital signal processing system -Compare the advantages ofdigital signal processing over analog signal processing. 1.2 Classify signals - Multi channel& Multidimensional signalsContinuous time verses Discrete -times Signal. -Continuousvalued verses Discrete -valued signals. 1.3 Concept of frequency in continuous time & discrete time signalsContinuous-time sinusoidal signals-Discrete-time sinusoidalsignals-Harmonically related complex exponential. 1.4 Analog to Digital & Digital to Analog conversion & explain thefollowing. a. Sampling of Analog signal, b. The sampling theorem. c. Quantization of continuous amplitude signals, d. Coding of quantized sample. e. Digital to analog conversion. f. Analysis of digital systems signals vs. discrete time signalssystems.

2	2	DISCRETE TIME SIGNALS & SYSTEMS	14	14	2.1 Concept of Discrete time signals. 2.1.1 Elementary Discrete time signals. 2.1.2 Classification Discrete time signal. 2.1.3 Simple manipulation of discrete time signal. 2.2 Discrete time system. 2.2.1 Input-output of system. 2.2.2 Block diagram of discrete- time systems 2.2.3 Classify discrete time system. 2.2.4 Inter connection of discrete -time system. 2.3 Discrete time time-invariant system. 2.3.1 Different techniques for the Analysis of linear system. 2.3.2 Resolution of a discrete time signal in to impulse. 2.3.3 Response of LTI system to arbitrary inputs using convolution sum. 2.3.4 Convolution & interconnection of LTI system properties. 2.3.5 Study systems with finite duration and infinite duration impulse response. 2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system. 2.4.2 Determine the impulse response of linear time invariant recursive system. 2.4.3 Correlation of Discrete Time signals
3	3	THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM	14	14	3.1 Basic principle of Optical communication. 3.1 Z-transform & its application to LTI system. 3.1.1 Direct Z-transform. 3.1.2 Inverse Z-transform. 3.2 Various properties of Z-transform. 3.3 Rational Z-transform. 3.3.1 Poles & zeros. 3.3.2 Pole location time domain behaviour for casual signals. 3.3.3 System function of a linear time invariant system. 3.4 Discuss inverse Z-transform. 3.4.1 Inverse Z-transform by partial fraction expansion. 3.4.2 Inverse Z-transform by contour Integration
4	4	DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES	12	12	4.1 Concept of discrete Fourier transform. 4.2 Frequency domain sampling and reconstruction of discrete timesignals. 4.3 Discrete Time Fourier transformation(DTFT) 4.4 Discrete Fourier transformation (DFT). 4.5 Compute DFT as a linear transformation. 4.6 Relate DFT to other transforms. 4.7 Property of the DFT. 4.8 Multiplication of two DFT & circular convolution
5	5	FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS.	10	10	5.1 Compute DFT & FFT algorithm. 5.2 Direct computation of DFT. 5.3 Divide and Conquer Approach to computation of DFT 5.4 Radix-2 algorithm. (Small Problems) 5.5 Application of FFT algorithms 5.6 Introduction to digital filters.(FIR Filters)& General considerations 5.7 Introduction to DSP architecture, familiarisation of different types of processor

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LESSON PLAN

BRANCH:ELECTRONICS & TELE-COMMUNICATION ENGG.	**SESSION:SUMMER-2023**	**SEMESTER:6TH**
NAME OF FACULTY: RACHANA NAYAK	**SUBJECT: RENEWABLE ENERGY SOURCES** (TH-4)	
NO OF CLASSES/WEEK GIVEN AS PER SYLLABUS= 04	**DATE OF SEMESTER STARTING** 14-02-2023	**DATE OF SEMESTER CLOSING** 23-05-2023
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	Energy Situation and Renewable Energy Sources	5	5	1.1 Renewable and Non-renewable Energy Sources 1.2 Energy and Environment 1.3 Origin of Renewable Energy Sources 1.4 Potential of Renewable Energy Sources 1.5 Direct-use Technology
2	2	Solar Radiation & Collectors	6	6	2.1 Solar Radiation Through Atmosphere 2.2 Terrestrial Solar Radiation 2.3 Measurement of Solar Radiation 2.4 Classification of Solar Radiation Instruments 2.5 Flat Plate Collectors 2.6 Optical Characteristics
3	3	Low-Temperature Applications of Solar Energy.	6	6	3.1 Swimming Pool Heating 3.2 Solar water Heating Systems 3.3 Natural Convection water Heating Systems 3.4 Solar Drying 3.5 Solar Pond
4	4	Passive Space Conditioning & Collectors	6	6	4.1 Principle Space conditioning 4.2 Passive building concepts- Heating, Direct gain, Indirect Gain, Passive Cooling, Shading,Paints, Collings 4.3 Construction of Concentrator
5	5	Solar Thermal Power Plants	8	8	5.1 Introduction 5.2 Solar Collection System 5.3 Thermal Storage for Solar Power Plants 5.4 Capacity Factor and Solar Multiple 5.5 Energy Conversion

6	6	Solar Photovoltaics	8	8	6.1 Band Theory of Solids, Physical Processes in a Solar Cell 6.2 Solar Cell Characteristics 6.3 Equivalent Circuit Diagram of Solar Cells 6.4 Cell Types - Crystalline Silicon Solar Cell , Solar Cells for Concentrating Photovoltaic Systems , Dye –sensitized Solar Cell (DSC) 6.5 Solar Module 6.6 Further System Components -Solar inverters ,Mounting Systems,Storage Batteries ,Other System Components 6.7 Grid-independent Systems -System Configuration 6.8 Grid-connected Systems -Small Roof Top Systems, Medium-scale PV Generator ,Centralized System
7	7	Wind Energy	5	5	7.1 Wind Flow and Wind Direction 7.2 Wind Measurements 7.3 Measurement of Pressure Head 7.4 Hot wire Anemometer 7.5 Cup Anemometer (Robinson's Anemometer) 7.6 Wind Direction Indicators
8	8	Wind Energy Converters	8	8	8.1 Historical Development 8.2 Aerodynamic of Rotor Blade -Wind Stream Profile -Buoyancy Coefficient and the Drag Coefficient 8.3 Components of a Wind Power Plant -Wind Turbine -Tower -Electric Generators – Foundation 8.4 Power Control -Slow Rotors; Poor Control Mechanism -Control of Fast Rotors
9	9	Energy economics	7	7	9.1 Present worth, Life cycle costing (LCC), Annual Life cycle costing(ALCC), Annual savings. calculations for Solar thermal system 9.2 Solar PV system, 9.3 Wind system, 9.4 Biomass system

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