

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (SUMMER-2026)

TH:1 ADVANCE COMMUNICATION ENGINEERING

Discipline: E&TC ENGG	Semester:6 TH	Name of the Teaching Faculty: ARUNA SATAPATHY
Subject: TH.1 Advance Communication Engineering	No of Days/per Week class allotted: 5P/Week	Semester from : 05 th Jan 2026 to 18 th April 2026 No of Weeks:15
Week	ClassDay	Theory/Topics
1st	1st	1. RADAR&NAVIGATIONAIDS (10)
	2nd	1.1 BasicRadar, advantages&applications
	3rd	1.2 Workingprincipleof SimpleRadarsystem, itstypes
	4th	1.3 Radarrangeequation&Performancefactorof radar.
	5th	1.4 Workingprincipleof PulsedRadarsystem.
2nd	1st	1.5 Functionof radarindicationand Workingprincipleof moving target
	2nd	1.6 DefineDopplereffect&Workingprincipleof C.WRadar.
	3rd	1.7 Radaraidsto Navigation
	4th	1.8 MTIRadar-workingprinciple
	5th	1.9 Aircraftlandingsystem.
3rd	1st	1.10 NavigationSatelliteSystem.(NAVSAT)&GPSSystem
	2nd	2. SATELLITECOMMUNICATION(15)
	3rd	2.1 BasicSatelliteTransponder&KeplersLaws
	4th	2.2 SatelliteOrbitalpatternsand elevation(LEO,MEO&GEO)categories
	5th	2.3 Conceptof GeostationarySatellite, calculateits height, velocity&round triptime delay&their advantage&disadvantage
4th	1st	2.4 Workingof theSatellitesubsystem
	2nd	2.5 Satellitefrequency allocationand frequencybands.
	3rd	2.6 Generalstructureof satelliteLinksystem(Uplink, Downlink, Transponder, Crosslink)
	4th	2.7 Workingprincipleof directbroadcastsystem(DBS)
	5th	2.8 Workingprincipleof VSATsystem.
5th	1st	2.9 Definemultipleaccessing&namevarious types.
	2nd	2.10 TimeDivisionMultipleAccessing(TDMA)&– blockdiagram, its advantages&dis-advantages.
	3rd	CodeDivisionMultipleAccessing(CDMA)– blockdiagram, itsadvantages& dis-advantages.
	4th	2.11 SatelliteApplication-CommunicationSatellite(MSAT), DigitalSatelliteRadio.
		2.12 Workingprincipleof GPSReceiver&Transmitter&applications.

	5th	2.13 Optical Satellite Link transmitter & Receiver
6th		3. OPTICAL FIBER COMMUNICATION (15) Basic principle of Optical communication. 3.2 Compare the advantages and disadvantages of optical fiber & metallic cables
	1st	
	2nd	3.3 Electromagnetic Frequency and wave lines spectrum
	3rd	3.4 Types of optical fiber & principles of propagation in a fiber using Ray
	4th	3.5 Optical fiber construction
	5th	3.6 Define terms: Velocity of propagation, Critical angle, Acceptance angle, numerical aperture
7th	1st	3.7 Optical fiber communications system - block diagram & working principle
	2nd	3.8 Modes of propagation and index profile of optical fiber
	3rd	3.9 Types of optical fiber configuration: Single-mode step index, Multi-mode step index, Multi-mode Graded index
	4th	3.10 Attenuation in optical fibers - Absorption losses, scattering, losses, bending losses, core and cladding losses - Dispersion - material Dispersion, waveguide dispersion, Intermodal dispersion
	5th	3.11 Optical sources (Transmitter) & types - LED - semiconductor laser diodes
8th	1st	3.12 LASER - its working principles, block diagram using laser feedback control circuit
	2nd	3.13 Optical detectors - PIN and APD diodes & Block diagram using APD Connectors and splices - Optical cables - Couplers
	3rd	3.14 Optical repeater & Single Channel system
	4th	3.15 Applications of optical fiber - civil, Industry and Military application
	5th	3.16 Concept of Wave Length Division Multiplexing (WDM) principles.
9th		4. TELECOMMUNICATIONS SYSTEM (10)
	1st	4.1 Working of Electronic Telephone System. (Telephone Set)
	2nd	4.2 Function of switching system.
	3rd	Call procedures
	4th	4.3 Space and time switching.
	5th	4.4 Numbering plan of telephone networks (National Schemes & International Numbering)
10th	1st	4.5 Working principle of a PBX & Digital EPABX.
	2nd	Working principle of Digital EPABX.
	3rd	4.6 Units of Power Measurement.
	4th	4.7 Working principle of Internet Protocol Telephone
	5th	4.8 Working principle of Internet Telephone
11th		5. DATA COMMUNICATION (10)
	1st	5.1 Basic concept of Data Communication
	2nd	5.2 Architecture, Protocols and Standards
	3rd	5.3 Data Communication Circuits

	4th	5.4TypesofTransmission
	5th	TransmissionModes
12th	1st	5.5DataCommunicationcodes
	2nd	5.6BasicideaofErrorcontrol
	3rd	ErrorDetection
	4th	5.7MODEM&itsbasicblockdiagram
	5th	commonfeaturesVoiceBandModem
13th	1st	6. WIRELESSCOMMUNICATION(15) 6.1 BasicconceptofCellPhone,frequencyreusechannelassignmentstrategic
	2nd	handoffco-channelInterferenceandsystemcapacityofaCellularRadio systems.
	3rd	6.2Conceptofimprovingcoverageandcapacityincellularsystem(Cell Splitting,Sectoring)
	4th	6.3WirelessSystemsanditsStandards.
	5th	6.4DiscusstheGSM(GlobalSystemforMobile)serviceandfeatures.
14th	1st	6.5ArchitectureofGSMsystem&
	2nd	GSMmobilestation&channeotypesofGSMsystem.
	3rd	6.6workingofforwardandreveresCDMAchannel,
	4th	thefrequencyandchannel specifications
	5th	6.7ArchitectureandfeaturesofGPRS.
15th	1st	6.8DiscussthemobileTCP,IPprotocol.
	2nd	6.9WorkingofWirelessApplicationProtocol(WAP).
	3rd	6.10FeaturesofSMS,MMS,1G,2G,
	4th	3G,4G&5GWirelessnetwork.
	5th	6.11SmartPhoneanddiscussitsfeaturesindicate throughBlockdiagram.


Signature of Teaching faculty

ASIAN SCHOOL OF TECHNOLOGY ,KHORDHA
ACADEMIC LESSON PLAN (SUMMER-2026)
TH:2 Control System & Component

Discipline: E&TC ENGG	Semester:6th	Name of teaching faculty- Anita Das
Subject: TH2: Control System & Component	No of Days /per week class allotted:4	Semester from : 05th Jan 2026 to 18th April 2026 No of Weeks:15
Week	Class Day	Theory Topics
1st	1st	1.1 Classification of Control system
	2nd	1.2 Open loop system & Closed loop system and its comparison
	3rd	1.3 Effects of Feed back
	4th	1.4 Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2nd	1st	1.5 Servomechanism 1.6 Regulators (Regulating systems)
	2nd	2.1 Transfer Function of a system & Impulse response
	3rd	2.2 Properties, Advantages& Disadvantages of Transfer Function
	4th	2.3 Poles & Zeroes of transfer Function, 2.4 Representation of poles & Zero on the s-plane
3rd	1st	2.5 Simple problems of transfer function of network
	2nd	2.5 Simple problems of transfer function of network
	3rd	2.5 Simple problems of transfer function of network
	4th	2.5 Simple problems of transfer function of network
4th	1st	2.5 Simple problems of transfer function of network
	2nd	3.1 Components of Control System
	3rd	3.2 Potentiometer
	4th	3.2Synchros, 3.3 DC motors, AC Servomotors
5th	1st	3.4 Modeling of Electrical Systems(R, L, C, Analogous systems)
	2nd	3.4 Modeling of Electrical Systems(R, L, C, Analogous systems)
	3rd	4.1 Definition of Basic Elements of a Block Diagram
	4th	4.2 Canonical Form of Closed loop System
6th	1st	4.3 Rules for Block diagram Reduction,
	2nd	4.3 Rules for Block diagram Reduction,
	3rd	4.6 Basic Definition in SFG & properties
	4th	4.7 Mason's Gain formula, 4.8 Steps for solving Signal flow Graph
7th	1st	4.9 Simple problems in Signal flow graph for network
	2nd	4.9 Simple problems in Signal flow graph for network
	3rd	5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy, sensitivity and robustness.
	4th	5.2 System Time Response
8th	1st	5.3 Analysis of Steady State Error
	2nd	5.4 Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	3rd	5.5 Parameters of first order system & second-order systems
	4th	5.5 Parameters of first order system & second-order systems
9th	1st	5.6 Derivation of time response Specification (Delay time, Rise time)
	2nd	5.6 Derivation of time response Specification (Peak time, Setting time ,Peak over shoot)
	3rd	6.1 Effect of parameter variation in Open loop System & Closed loop Systems
	4th	6.2 Introduction to Basic control Action
	1st	Basic modes of feedback control: proportional, integral and derivative

10th	2nd	6.3 Effect of feedback on overall gain, Stability
	3rd	6.4 Realization of Controllers(P, PI) with OPAMP
	4th	6.4 Realization of Controllers(PD,PID) with OPAMP
11th	1st	7.1 Effect of location of poles on stability
	2nd	7.2 Routh Hurwitz stability criterion.
	3rd	7.3 Steps for Root locus method
	4th	7.4 Root locus method of design(Simple problem)
12th	1st	7.4 Root locus method of design(Simple problem)
	2nd	7.4 Root locus method of design(Simple problem)
	3rd	7.4 Root locus method of design(Simple problem)
	4th	7.4 Root locus method of design(Simple problem)
13th	1st	8.1 Frequency response ,Relationship between time & frequency response
	2nd	8.2 Methods of Frequency response, 8.3 Polar plots & steps for polar plot
	3rd	8.4 Bodes plot & steps for Bode plots
	4th	8.5 Stability in frequency domain, Gain Margin& Phase margin
14th	1st	8.6 Nyquist plots. Nyquist stability criterion.
	2nd	8.7 Simple problems as above
	3rd	8.7 Simple problems as above
	4th	9.1 Concepts of state, state variable, state model,
15th	1st	9.1 Concepts of state, state variable, state model,
	2nd	9.2 state models for linear continuous time functions(Simple)
	3rd	9.2 state models for linear continuous time functions(Simple)
	4th	9.2 state models for linear continuous time functions(Simple)

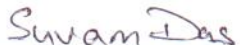

Signature of Teaching faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA
ACADEMIC LESSON PLAN (SUMMER-2026)
Subject: TH:3 DIGITAL SIGNAL PROCESSING

Discipline: E & TC ENGG	Semester: 6th	Name of the Teaching Faculty: SUVAM DAS
Subject: TH:3 Digital Signal Processing	No of Days /per week class allotted: 04 p/week	Semester from : 05 th Jan 2026 to 18 th April 2026 No of Weeks: 15
Week	Class Day	Theory / Topics
1st	1st	1. Introduction of Signals, Systems & Signal processing (10) 1.1 Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system -
	2 nd	Compare the advantages of digital signal processing over analog signal processing.
	3 rd	1.2 Classify signals - Multi channel & Multi-dimensional signals- Continuous time versus Discrete -time Signal. -
	4th	Continuous valued versus Discrete -valued signals.
2nd	1st	1.3 Concept of frequency in continuous time & discrete time signals- Continuous-time sinusoidal signals- Discrete-time sinusoidal signals- Harmonically related complex exponential.
	2 nd	1.4 Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal,
	3 rd	b. The sampling theorem.
	4th	c. Quantization of continuous amplitude signals, d. Coding of quantized sample.
3rd	1st	e. Digital to analog conversion.
	2 nd	f. Analysis of digital systems signals vs. discrete time signals systems.
	3 rd	2. DISCRETE TIME SIGNALS & SYSTEMS (14) 2.1 Concept of Discrete time signals. 2.1.1 Elementary Discrete time signals. 2.1.2 Classification Discrete time signal
	4th	2.1.3 Simple manipulation of discrete time signal.
4th	1st	2.2 Discrete time system. 2.2.1 Input-output of system.
	2 nd	2.2.2 Block diagram of discrete- time systems
	3 rd	2.2.3 Classify discrete time system.
	4th	2.2.4 Inter connection of discrete -time system.

5th	1st	2.3 Discrete time time-invariant system. 2.3.1 Different techniques for the Analysis of linear system.
	2 nd	2.3.2 Resolution of a discrete time signal in to impulse.
	3 rd	2.3.3 Response of LTI system to arbitrary inputs using convolution sum.
	4th	2.3.4 Convolution & interconnection of LTI system - properties.
6th	1st	2.3.5 Study systems with finite duration and infinite duration impulse response.
	2 nd	2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system.
	3 rd	2.4.2 Determine the impulse response of linear time invariant recursive system.
	4th	2.4.3 Correlation of Discrete Time signals
7th	1st	3. THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. (14) 3.1 Z-transform & its application to LTI system.
	2 nd	3.1.1 Direct Z-transform.
	3 rd	3.1.2 Inverse Z-transform.
	4th	3.2 Various properties of Z-transform.
8th	1 st	Continue
	2 nd	3.3 Rational Z-transform.
	3 rd	3.3.1 Poles & zeros.
	4th	3.3.2 Pole location time domain behaviour for casual signals.
9th	1 st	3.3.3 System function of a linear time invariant system.
	2 nd	3.4 Discuss inverse Z-transform.
	3 rd	3.4.1 Inverse Z-transform by partial fraction expansion.
	4th	Continue
10th	1 st	3.4.2 Inverse Z-transform by contour Integration
	2 nd	Continue
	3 rd	4. DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES(12) 4.1 Concept of discrete Fourier transform.
	4th	4.2 Frequency domain sampling and
11th	1 st	reconstruction of discrete time signals.
	2 nd	4.3 Discrete Time Fourier transformation(DTFT)
	3 rd	Continue
	4th	4.4 Discrete Fourier transformation (DFT).
12th	1 st	Continue
	2 nd	4.5 Compute DFT as a linear transformation.
	3 rd	4.6 Relate DFT to other transforms.
	4th	4.7 Property of the DFT.

13th	1 st	4.8 Multiplication of two DFT &
	2 nd	circular convolution
	3 rd	5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS(10) 5.1 Compute DFT & FFT algorithm.
	4 th	Continue
	1 st	5.2 Direct computation of DFT.
	2 nd	5.3 Divide and Conquer Approach to computation of DFT
14th	3 rd	5.4 Radix-2 algorithm. (Small Problems)
	4 th	5.5 Application of FFT algorithms
15th	1 st	5.6 Introduction to digital filters.
	2 nd	(FIR Filters)& General considerations
	3 rd	5.7 Introduction to DSP architecture,
	4 th	familiarization of different types of processor


Signature of Teaching faculty

ASIAN SCHOOL OF TECHNOLOGY
ACADEMIC LESSON PLAN (SUMMER 2026)
TH:4 RENEWABLE ENERGY SOURCES

Discipline: E&TC ENGG	Semester :6th	NAME OF TEACHING FACULTY- Bhabani Sankar Behera
Subject: TH4 Renewable Energy Sources	No of Days /per week class allotted: 4	Semester from : 05 th Jan 2026 to 18 th April 2026 No of Weeks:15
Week	Class Day	Theory / Practical Topics
1st	1st	1. Energy Situation and Renewable Energy Sources (5) 1.1 Renewable and Non-renewable Energy Sources
	2nd	1.2 Energy and Environment
	3rd	1.3 Origin of Renewable Energy Sources
	4th	1.4 Potential of Renewable Energy Sources
2nd	1st	1.5 Direct-use Technology
	2nd	2. Solar Radiation & Collectors (6) 2.1 Solar Radiation Through Atmosphere
	3rd	2.2 Terrestrial Solar Radiation
	4th	2.3 Measurement of Solar Radiation
3rd	1st	2.4 Classification of Solar Radiation Instruments
	2nd	2.5 Flat Plate Collectors
	3rd	2.6 Optical Characteristics
	4th	3. Low-Temperature Applications of Solar Energy. (6) 3.1 Swimming Pool Heating
4th	1st	3.2 Solar water Heating Systems
	2nd	3.3 Natural Convection water Heating Systems
	3rd	Continue
	4th	3.4 Solar Drying
5th	1st	3.5 Solar Pond
	2nd	4. Passive Space Conditioning & Collectors (7) 4.1 Principle Space conditioning
	3rd	Continue
	4th	4.2 Passive building concepts- Heating, Direct gain, Indirect Gain,
6th	1st	Passive Cooling, Shading ,Paints, Coolings
	2nd	4.3 Construction of Concentrator
	3rd	Continue
	4th	4.4 Energy losses
7th	1st	5. Solar Thermal Power Plants (8) 5.1 Introduction
	2nd	5.2 Solar Collection System
	3rd	Continue
	4th	5.3 Thermal Storage for Solar Power Plants
	1st	Continue

8th	2nd	5.4 Capacity Factor and Solar Multiple
	3rd	Continue
	4th	5.5 Energy Conversion
9th	1st	6. Solar Photovoltaics (8) 6.1 Band Theory of Solids, Physical Processes in a Solar Cell ,
	2nd	6.2 Solar Cell Characteristics
	3rd	6.3 Equivalent Circuit Diagram of Solar Cells
	4th	6.4 Cell Types - Crystalline Silicon Solar Cell , Solar Cells for Concentrating Photovoltaic Systems , Dye –sensitized Solar Cell (DSC)
10th	1st	6.5 Solar Module
	2nd	6.6 Further System Components -Solar inverters ,Mounting Systems, Storage Batteries ,Other System Components
	3rd	6.7 Grid-independent Systems -System Configuration
	4th	6.8 Grid-connected Systems -Small Roof Top Systems ,Medium-scale PV Generator ,Centralized System
11th	1st	7. Wind Energy (5) 7.1 Wind Flow and Wind Direction
	2nd	7.2 Wind Measurements
	3rd	7.3 Measurement of Pressure Head. 7.4 Hot wire Anemometer
	4th	7.5 Cup Anemometer (Robinson's Anemometer)
12th	1st	7.6 Wind Direction Indicators
	2nd	8. Wind Energy Converters(8) 8.1 Historical Development
	3rd	8.2 Aerodynamic of Rotor Blade -Wind Stream Profile
	4th	Buoyancy Coefficient and the Drag Coefficient
13th	1st	8.3 Components of a Wind Power Plant -Wind Turbine -Tower -Electric Generators –Foundation
	2nd	Continue
	3rd	8.4 Power Control -Slow Rotors;
	4th	Poor Control Mechanism -Control of Fast Rotors
14th	1st	9. Energy economics (7) 9.1 Present worth, Life cycle costing (LCC), Annual Life cycle costing(ALCC),
	2nd	Annual savings. calculations for Solar thermal system
	3rd	9.2 Solar PV system,
	4th	Continue
15th	1st	9.3 Wind system,
	2nd	Continue
	3rd	9.4 Biomass system
	4th	Continue

Dhabani Shankar Behera

Signature of teaching faculty