ACADEMIC LESSON PLAN OF WINTER 2026

Discipline: ETC	Semester: 5th	Name of the Teaching Faculty: **ABINASH MISHRA**
Subject: **TH:1- DATA COMMUNICATION & COMPUTER NETWORKS**	No. of days/per week class allotted:3p/ week	Semester from: **01.07.2026 to 05.11.2026** No. of weeks:15 weeks
Week	**Class/week**	**Theory Topics**
1st	1st	Network & Protocol 1.1 Data Communication
	2nd	1.2 Networks
	3rd	1.2 Networks
2nd	1st	1.3 Protocol & Architecture, Standards- OSI, TCP/IP
	2nd	1.3 Protocol & Architecture, Standards- OSI, TCP/IP
	3rd	Data Transmission & Media 2.1 Data transmission Concepts and Terminology
3rd	1st	2.2 Channel capacity
	2nd	2.3 Transmission media
	3rd	2.4 Guided Transmission
4th	1st	2.4 Guided Transmission
	2nd	2.6 Wireless Transmission
	3rd	2.6 Wireless Transmission
5th	1st	Data Encoding 3.1 Data encoding
	2nd	3.2 Digital data digital signals
	3rd	3.2 Digital data digital signals
6th	1st	3.3 Digital data analog signals
	2nd	3.4 Analog data digital signals
	3rd	3.4 Analog data digital signals
7th	1st	3.5 Analog data analog signals
	2nd	Data Communication & Data link control 4.1 Asynchronous and Synchronous Transmission
	3rd	4.1 Error Detection
8th	1st	4.3 Line configuration
	2nd	4.4 Flow Control
	3rd	4.5 Error Control
9th	1st	4.6 Multiplexing
	2nd	4.7 FDM synchronous TDM, 4.8 Statistical TDM
	3rd	Switching & Routing 5.1 Circuit Switching networks
10th	1st	5.2 Packet Switching principles
	2nd	5.3 X.25
	3rd	5.4 Routing in Packet switching
11th	1st	5.5 Congestion
	2nd	5.6 Effects of congestion, congestion control
	3rd	5.7 Traffic Management
12th	1st	LAN Technology 6.1 Topology and Transmission Media
	2nd	6.2 LAN protocol architecture
	3rd	6.4 Bridges, Hub & Switch
13th	1st	6.4 Bridges, Hub & Switch

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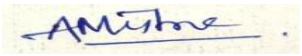
	2nd	6.5 Ethernet (CSMA/CD)
	3rd	6.6 Wireless LAN Technology
14th	1st	6.6 Wireless LAN Technology
	2nd	TCP/IP 7.1 TCP/IP Protocol Suite
	3rd	7.2 Basic Protocol functions
15th	1st	7.3 Principles of Internetworking
	2nd	7.3 Internet Protocol operations
	3rd	7.4 Internet Protocol

CO No.	Course Outcome
CO1	Explain the fundamentals of data communication, networking concepts, communication protocols, and the OSI and TCP/IP reference models.
CO2	Analyze data transmission techniques, channel capacity, and the characteristics of guided and unguided transmission media used in computer networks.
CO3	Describe data encoding methods, error detection and correction techniques, flow control, multiplexing, and data link control mechanisms for reliable communication.
CO4	Compare switching techniques (circuit and packet switching), routing principles, congestion control methods, and traffic management strategies in communication networks.
CO5	Explain LAN technologies, Ethernet (CSMA/CD), networking devices (Hub, Bridge, Switch), wireless LAN concepts, and the architecture and operation of the TCP/IP protocol suite for internetworking.



Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF WINTER 2026

Discipline: ETC	Semester: 3rd	Name of the Teaching Faculty: **ABINASH MISHRA**
Subject: ELECTRONICS DEVICES	No. of days/per week class allotted:3p/week	Semester from: **01.07.2026 to 05.11.2026** No. of weeks:15 weeks
Week	**Class/week**	**Theory Topics**
1st	1st	**Introduction to Semiconductor Physics** 1.1 Review of Quantum Mechanics 1.2 Electrons in periodic Lattices
	2nd	1.3 Energy bands in intrinsic and extrinsic silicon 1.4 Carrier transport 1.4.1 Diffusion current
	3rd	1.4.2 Drift current 1.4.3 Mobility and resistivity
2nd	1st	**P-N Junction Diodes** 2.1 Generation and recombination of carriers 2.2 Poisson and continuity equation
	2nd	2.3 P-N Junction Diodes 2.3.1 Construction of P-N Junction Diode
	3rd	2.3.2 Operating Principle 2.3.3 P-N junction characteristics
3rd	1st	2.3.4 I-V characteristics
	2nd	2.3.5 Small signal switching models
	3rd	2.3.6 Avalanche breakdown
4th	1st	2.3.7 Zener diode
	2nd	2.3.8 Schottky diode
	3rd	2.3.9 LED
5th	1st	2.3.10 Photodiode and solar cell
	2nd	**Bipolar Junction Transistor (BJT)** 3.1 Construction of BJT 3.2 Operating Principle of BJT
	3rd	3.3 Types of BJT
6th	1st	3.5 I-V characteristics 3.4 Working principle of p-n-p and n-p-n BJT
	2nd	3.6 Ebers Moll Model
	3rd	3.7 Different types of transistor connection 3.7.1 Common Base (CB) 3.7.2 Common Emitter (CE) 3.7.3 Common Collector (CC)
7th	1st	3.8 Input and output characteristics of transistor in different connections
	2nd	3.9 Define ALPHA, BETA and GAMMA of transistors in various modes.
	3rd	3.10 Establish the Mathematical relationship between ALPHA, BETA and GAMMA
8th	1st	311 Basic concept of Biasing 3.12 Types of Biasing
	2nd	3.13 h-parameter model of BJT 3.14 Load line and determine the Q-point. 3.15 Types of Coupling
	3rd	3.16 Working principle and use of R-C Coupled Amplifier 3.17 Frequency Responses of R-C coupled Amplifier
9th	1st	**FIELD EFFECT TRANSISTOR (FET)** 4.1 FET & its classifications
	2nd	4.2 Differentiate between JFET & BJT
	3rd	4.3 Construction, working principle & characteristics of JEFT
10th	1st	4.4 Parameters of JFET & establish relation among JFET parameters
	2nd	4,5 JEFT as an amplifier

	3rd	4.5 Construction and working principle of MOSEFT 4.6 Classification of MOSEFT
11th	1st	4.7 Characteristics (Drain & Transfer) of MOSEFT
	2nd	4.8 Explain the operation of CMOS, VMOS & LDMOS.
	3rd	**FEED BACK AMPLIFIER & OSCILLATOR** 5.1 Define & classify Feedback Amplifier 5.2 Types of feedback – negative &positive feedback.
12th	1st	5.3 Characteristics voltage gain, bandwidth, input Impedance output impedance, stability, noise and distortion in amplifiers.
	2nd	5.4 Oscillator 5.4.1 Block diagram of sine wave oscillator
	3rd	5.4.2 Types Requirement of oscillation
13th	1st	5.4.3 Barkhausen criterion
	2nd	5.5 LC oscillators 5.5.1 Colpitts Oscillators
	3rd	5.5 LC oscillators 5.5.1 Colpitts Oscillators
14th	1st	5.5.2 Hartley Oscillators
	2nd	5.5.3 Wien Bridge Oscillators
	3rd	5.5.3 Wien Bridge Oscillators
15th	1st	**Integrated Circuit Fabrication Process** 6.1 Oxidation 6.2 Diffusion 6.3 Ion implantation
	2nd	6.4 Photo-lithography 6.5 Etching
	3rd	6.7 Chemical vapor deposition 6.8 Sputtering 6.9 Twin-tub CMOS process

Course Outcomes (COs) - Electronics Devices

CO1: Describe the principles of semiconductor physics and apply it to electronic devices.

CO2: Select different devices for different applications.

CO3: Explain the mathematical models of semiconductor devices for circuits.

CO4: Discuss the basic processes required for fabrication of electronic devices.

Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF WINTER 2026

Discipline: ETC	Semester: 3rd	Name of the Teaching Faculty: **ABINASH MISHRA**
Subject: SIGNAL & SYSTEMS	No. of days/per week class allotted:3p/week	Semester from: **01.07.2026 to 05.11.2026** No. of weeks: 15 weeks
Week	**Class/week**	**Theory Topics**
1st	1st	**Introduction to Signals and Systems** 1.1 Signals and systems as seen in everyday life
	2nd	1.2 Signals and systems in various branches of engineering
	3rd	1.3 Electrical, mechanical, hydraulic, thermal, biomedical signals and systems as examples
2nd	1st	1.3 Electrical, mechanical, hydraulic, thermal, biomedical signals and systems as examples
	2nd	1.4 Extracting the common essence and requirements of signal and system
	3rd	**Formalizing signals** 2.1 Energy and power signals
3rd	1st	2.2 Signal properties 2.2.1 Periodicity 2.2.2 Absolute integrability 2.2.3 Determinism and stochastic character
	2nd	2.3 Some special signals of importance 2.3.1 The unit step 2.3.2 The unit impulse 2.3.3 The sinusoid 2.3.4 The complex exponential
	3rd	2.4 some special time-limited signals 2.4.1 Continuous and discrete time signals, 2.4.2 Continuous and discrete amplitude signals.
4th	1st	2.5 Formalizing systems- system properties 2.5.1 Linearity 2.5.2 Additivity and homogeneity
	2nd	2.5.3 Shift-invariance 2.5.4 Causality
	3rd	2.5.5 Stability 2.5.6 Reliability
5th	1st	**Continuous time and discrete time Systems** 3.1 Linear shift-invariant (LSI) systems in detail
	2nd	3.2 The impulse response and step response
	3rd	3.3 Convolution
6th	1st	3.4 Input-output behavior with aperiodic convergent inputs
	2nd	3.5 Cascade interconnections
	3rd	3.6 Characterization of causality and stability of linear shift-invariant systems
7th	1st	3.7 System representation through differential equations and difference equations
	2nd	**Periodic and semi-periodic inputs to an LSI system** 4.1 The notion of a frequency response and its relation to the impulse response
	3rd	4.2 Fourier series representation
8th	1st	4.3 The Fourier Transform
	2nd	4.4 Convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality.
	3rd	4.5 The Discrete-Time Fourier Transform (DTFT)
9th	1st	4.6 The Discrete Fourier Transform (DFT)
	2nd	4.7 Parseval's Theorem 4.8 The idea of signal space and Orthogonal bases of signals.

	3rd	**Laplace Transform for continuous time signals and systems-** 5.1 The notion of Eigen functions of LSI systems
10th	1st	5.2 A basis of Eigen functions
	2nd	5.3 Region of convergence
	3rd	5.4 System functions
11th	1st	5.5 Poles and zeros of system functions and signals
	2nd	5.6 Laplace domain analysis 5.7 Solution to differential equations and system behavior
	3rd	5.8 Generalization of Parseval's Theorem
12th	1st	**System realization** 6.1 System realization through block-diagram representation and system interconnection
	2nd	6.2 State-space analysis and multi-input, multi-output representation.
	3rd	6.3 The state-transition matrix and its role.
13th	1st	6.4 The Sampling Theorem and its implications 6.4.1 Spectra of sampled signals.
	2nd	6.5 Reconstruction: 6.5.1 Ideal interpolator 6.5.2 Zero-order hold 6.5.3 First-order hold
	3rd	6.6 Aliasing and its effects.
14th	1st	6.7 Relation between continuous and discrete time systems.
	2nd	**Applications of signal and system theory** 7.1 Modulation for communication and filtering
	3rd	7.1 Modulation for communication and filtering
15th	1st	7.2 Time-frequency representation and the uncertainty principle
	2nd	7.2 Time-frequency representation and the uncertainty principle
	3rd	7.3 Short-time Fourier Transforms and wavelet transforms.

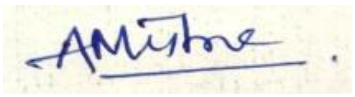
Course Outcomes (COs) - SIGNAL & SYSTEMS

CO1: Identify the sources of signals, and systems in real life.

CO2: Characterize different types of signals and systems.

CO3: Represent continuous-time and discrete-time systems in different mathematical forms.

CO4: Analyze system behaviour using time and frequency domain techniques.



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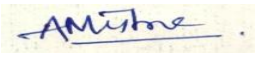
ACADEMIC LESSON PLAN OF WINTER 2026

Discipline: ETC	Semester: 3rd	Name of the Teaching Faculty: **ABINASH MISHRA**
Subject: ELECTRONICS DEVICE LAB	No. of days/per week class allotted:4p/week	Semester from: **01.07.2026 to 05.11.2026** No. of weeks: 15 weeks

Week	Class/week	Theory Topics
1st	1st	Characteristics of P-N junction diode
	2nd	Characteristics of P-N junction diode
2nd	1st	Characteristics of Zener diode
	2nd	Characteristics of Zener diode
3rd	1st	Input-Output and Transfer characteristics of CE and CC Amplifier
	2nd	Input-Output and Transfer characteristics of CE and CC Amplifier
4th	1st	Characteristics of Photo-diode and Photo transistor
	2nd	Characteristics of Photo-diode and Photo transistor
5th	1st	Transfer characteristics of JFET
	2nd	Transfer characteristics of JFET
6th	1st	Transfer characteristics of MOSFET (with depletion and enhancement mode)
	2nd	Transfer characteristics of MOSFET (with depletion and enhancement mode)
7th	1st	Characteristics of LED with three different wavelengths
	2nd	Characteristics of LED with three different wavelengths
8th	1st	Half wave rectifier
	2nd	Half wave rectifier
9th	1st	Full wave rectifier with 2 diodes.
	2nd	Full wave rectifier with 2 diodes.
10th	1st	Full wave rectifier with 4 diodes (Bridge rectifier)
	2nd	Full wave rectifier with 4 diodes (Bridge rectifier)
11th	1st	Construct & Find the gain of (i) Class A Amplifier (ii) Class B Amplifier (iii) Class C Tuned Amplifier
	2nd	Construct & Find the gain of (i) Class A Amplifier (ii) Class B Amplifier (iii) Class C Tuned Amplifier
12th	1st	Construct & test Class B -Push Pull amplifier & observe the wave form
	2nd	Construct & test Class B -Push Pull amplifier & observe the wave form
13th	1st	Construct & calculate the frequency & Draw the wave form of (i) Hartly Oscillator (ii) Collpit's Oscillator (iii) Wein Bridge Oscillator (iv) R-C phase shift Oscillator
	2nd	Construct & calculate the frequency & Draw the wave form of (i) Hartly Oscillator (ii) Collpit's Oscillator (iii) Wein Bridge Oscillator (iv) R-C phase shift Oscillator
14th	1st	Simulation experiments using PSPICE or Multisim.
	2nd	Simulation experiments using PSPICE or Multisim.
15th	1st	Simulation experiments using PSPICE or Multisim.
	2nd	Simulation experiments using PSPICE or Multisim.



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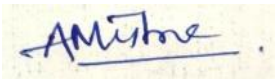
Course Outcomes (COs)

Course Code: **ETCPC211**
Course Title: **Electronics Devices Laboratory**

CO No.	Course Outcome
CO1	Perform experiments to obtain and analyze the characteristics of semiconductor devices such as P-N junction diode, Zener diode, BJT, JFET, MOSFET, LED, photodiode and phototransistor.
CO2	Construct, test and analyze rectifier circuits, amplifier circuits and oscillator circuits using semiconductor devices.
CO3	Measure and interpret important electronic parameters such as gain, frequency response, transfer characteristics and output waveforms using standard laboratory instruments.
CO4	Simulate semiconductor devices and analog electronic circuits using PSPICE/Multisim and compare simulation results with practical observations.
CO5	Identify electronic components, write their specifications, prepare laboratory reports and demonstrate safe laboratory practices with effective teamwork and communication.



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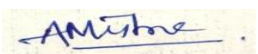
ACADEMIC LESSON PLAN OF WINTER 2026

Discipline: ETC	Semester: 5th	Name of the Teaching Faculty: **ABINASH MISHRA**
Subject: PR:1- DATA COMMUNICATION & COMPUTER NETWORKS LABORATORY	No. of days/per week class allotted:4p/week	Semester from: **01.07.2026 to 05.11.2026** No. of weeks: 15 weeks

Week	Class/week	Theory Topics
1st	1st	Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network
	2nd	Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network
2nd	1st	Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
	2nd	Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
3rd	1st	Making of cross cable and straight cable
	2nd	Making of cross cable and straight cable
4th	1st	Install and configure a network interface card in a workstation
	2nd	Install and configure a network interface card in a workstation
5th	1st	Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
	2nd	Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
6th	1st	Managing user accounts in windows and LINUX
	2nd	Managing user accounts in windows and LINUX
7th	1st	Sharing of Hardware resources in the network.
	2nd	Sharing of Hardware resources in the network.
8th	1st	Use of Netstat and its options.
	2nd	Use of Netstat and its options.
9th	1st	Connectivity troubleshooting using PING, IPCONFIG
	2nd	Connectivity troubleshooting using PING, IPCONFIG
10th	1st	Installation of Network Operating System(NOS)
	2nd	Installation of Network Operating System(NOS)
11th	1st	Create a network of at least 6 computers
	2nd	Create a network of at least 6 computers
12th	1st	Study of Layers of Network and Configuring Network Operating System
	2nd	Study of Layers of Network and Configuring Network Operating System
13th	1st	Study of Routing and Switching, configuring of Switch and Routers, troubleshooting of networks
	2nd	Study of Routing and Switching, configuring of Switch and Routers, troubleshooting of networks
14th	1st	Study of Scaling of Networks, Design verities of LAN and forward of Traffic
	2nd	Study of Scaling of Networks, Design verities of LAN and forward of Traffic
15th	1st	Study WAN concepts and Configure and forward Traffic in WAN
	2nd	Study WAN concepts and Configure and forward Traffic in WAN



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Course Outcomes (COs)

Course Code: ETCPC305
Course Title: Data Communication & Computer Networks Laboratory

CO No.	Course Outcome
CO1	Identify network topologies, transmission media, connectors, and prepare straight-through and crossover Ethernet cables following networking standards.
CO2	Install and configure network interface cards, assign IPv4/IPv6 addresses, manage user accounts, and configure network operating systems in Windows and Linux environments.
CO3	Design, implement, and verify small Local Area Networks (LANs) using switches and routers while configuring routing and switching functions.
CO4	Apply network diagnostic and troubleshooting tools such as **PING**, **IPCONFIG**, and **NETSTAT** to identify and resolve connectivity issues in computer networks.
CO5	Configure and analyze LAN and WAN communication, implement basic network programming concepts, and evaluate network performance, scalability, security, and traffic forwarding.

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