5 IT Telecommunication Fundamentals **Shalini**

SNO	UNIT	LECTURE	Contents
1	Data Transmission	LECTURE1	Terminology, Frequency, spectrum, bandwidth, analog and digital transmission
		LECTURE2	Transmission impairments, channel capacity, Transmission Media.
	Wireless Transmission	LECTURE3	Antenna and antenna gain.
	Physical Layer	LECTURE4	Line Encoding Schemes. Concept of bit period, effect of clock skew, Synchronous and Asynchronous communication.
	Data Link Layer	LECTURE5	Functions of data link layer and design issues
	Flow Control	LECTURE6	Flow control in loss less and lossy channels using stop-and-wait, sliding window protocols. Performance of protocols used for flow control.
2	Error Control Coding	LECTURE7	Error Detection
		LECTURE8	Two Dimensional Parity Checks
		LECTURE9	Internet Checksum, Polynomial Codes, Standardized polynomial codes

		LECTURE10	Error detecting capability of a polynomial codes
		LECTURE11	Linear codes, performance of linear codes, error detection & correction using linear codes.
	Data Link Control	LECTURE12	HDLC & PPP including frame structures.
	MAC Sublayer	LECTURE13	Channel Allocation Problem, Pure and slotted Aloha
		LECTURE14	CSMA,CSMA/CD, collision free multiple access
		LECTURE15	Throughput analysis of pure and slotted Aloha.
		LECTURE16	Ethernet Performance
3	Wireless LAN	LECTURE17	Hidden node and Exposed node Problems
		LECTURE18	RTS/CTS based protocol
		LECTURE19	802.11 Architecture, protocol stack
		LECTURE20	Physical layer, MAC Sublayer
		LECTURE21	Bluetooth Architecture and Protocol Stack
	Data Link Layer Switching	LECTURE22	Bridges (Transparent, Learning and Spanning Tree)
		LECTURE23	Virtual LANs
4	Multiplexing	LECTURE24	Frequency division, time division

		LECTURE25	ADSL, DS1 and DS3 carriers
	Multiple Accesses	LECTURE26	TDMA frame structure, TDMA Burst Structure
		LECTURE27	TDMA Frame efficiency, TDMA Superframe structure
		LECTURE28	Frame acquisition and synchronization
		LECTURE29	Slip rate in digital terrestrial networks
	Switching	LECTURE30	Qualitative Description of Space division, timedivision and space-time-space division switching
5	Spread Spectrum Techniques	LECTURE31	Direct sequence(DSSS) & frequency hopping(FHSS)
		LECTURE32	Performance consideration in DSSS & FHSS
	Code Division Multiple Access (CDMA)	LECTURE33	frequency & channel specifications,
		LECTURE34	forward & reverse CDMA channel
		LECTURE35	pseudo noise(PN) sequences, m-sequence
		LECTURE36	orthogonal code, gold sequences
		LECTURE37	Walsh codes, synchronization
		LECTURE38	power control, handoff

		LECTURE39	capacity of CDMA system
		LECTURE40	IMT-2000, WCDM

3EC DATA STRUCTURES & ALGORITHMS **Shalini**

SNO	UNIT	LECTURE	Contents
1	Introduction	LECTURE1	Definition & characteristics of algorithms
		LECTURE2	complexity of program
		LECTURE3	Asymptotic notation
		LECTURE4	time and space complexity
		LECTURE5	Array as storage element
		LECTURE6	Row major & column major form of arrays
		LECTURE7	computation of address of elements of n dimensional array
2	LINEAR DATA STRUCTURES	LECTURE8	Polynomial representation
		LECTURE9	Sparse matrices
		LECTURE10	Stack
		LECTURE11	Queue
		LECTURE12	Dequeue
		LECTURE13	Circular queue

		LECTURE14	Evaluation of Expression using stack
		LECTURE15	conversion of expression
		LECTURE16	Recursion
3	LINKED LISTS	LECTURE17	Types of linked list
		LECTURE18	Insertion in linked list
		LECTURE19	Deletion in linked list
		LECTURE20	Comparison of arrays and linked lists
		LECTURE21	Linked implementation of stack,queue and dequeue
		LECTURE22	insertion, deletion and traversal in stack,queue and dequeue
		LECTURE23	Polynomial representation using linked lists
		LECTURE24	Head Node in linked lists
		LECTURE25	Sequential and binary search
4	TREES	LECTURE26	Introduction of non-linear structures & tree
		LECTURE27	binary tree Insertion ,deletion, traversal
		LECTURE28	constructing binary tree from traversal
		LECTURE29	Threaded binary Tree

		LECTURE30	AVL tree
		LECTURE31	insertion into and deletion from AVL tree
		LECTURE32	Application of trees
5	GRAPHS & SORTING	LECTURE33	Relation between tree & graph
		LECTURE34	adjacency matrix and list
		LECTURE35	Depth first and breadth first traversal
		LECTURE36	spanning tree
		LECTURE37	Single source single destination shortest path algorithms
		LECTURE38	Insertion, quick, heap sort algorithms
		LECTURE39	topological and bubble sorting algorithms
		LECTURE40	Comparison of sorting algorithms

7 IT Data Mining and Warehousing **Shalini**

S.NO.	UNIT	LECTURE	CONTENTS
1	Introduction	LECTURE1	Overview,Motivation(forData Mining),
		LECTURE2	DataMining-Definition &Functionalities,
		LECTURE3	DataProcessing, Form ofDataPreprocessing,
		LECTURE4	DataCleaning: MissingValues,Noisy Data, (Binning, Clustering, Regression, Computer and Human inspection),
		LECTURE5	InconsistentData,DataIntegrationandTransformation. DataReduction:-DataCube Aggregation
		LECTURE6	Dimensionalityreduction,Data Compression,NumerosityReduction
		LECTURE7	Clustering,Discretization
		LECTURE8	Concept hierarchygeneration.
2	Mining Algorithms	LECTURE9	Concept Description:Definition,Data Generalization Mining Classcomparisons–
		LECTURE10	Analytical Characterization, Analysis of attribute relevance,
		LECTURE11	Statistical measuresin largeDatabases. AprioriAlgorithm,
		LECTURE12	Measuring Central Tendency,Measuring Dispersion ofData,

		LECTURE13	Graph Displays of BasicStatistical class Description,Mining Association Rules in Large Databases,
		LECTURE14	Association rule mining, mining Single-DimensionalBooleanAssociation rules from Transactional Databases
		LECTURE15	Mining Multilevel Association rules from Transaction Databasesand Mining Multi- Dimensional AssociationrulesfromRelational Databases.
3	Classification and Prediction	LECTURE16	What isClassification &Prediction,Issuesregarding Classification and prediction, .
		LECTURE17	Decision tree, BayesianClassification, Classification byBackpropagation,
		LECTURE18	Multilayer feed-forwardNeural Network BackpropagationAlgorithm,
		LECTURE19	Classification methods K-nearest neighbourclassifiers, GeneticAlgorithm.
		LECTURE20	Cluster Analysis: Data types in cluster analysis,Categories ofclusteringmethods,Partitioningmethods.
		LECTURE21	Hierarchical Clustering- CUREandChameleon.Density BasedMethods-DBSCAN
		LECTURE22	OPTICS.Grid Based Methods- STING, CLIQUE
		LECTURE23	Model Based Method –Statistical Approach, NeuralNetworkapproach,OutlierAnalysis
4	Data Warehousig	LECTURE24	DataWarehousing:Overview, Definition,
		LECTURE25	DeliveryProcess,
		LECTURE26	Difference between Database SystemandDataWarehouse,

		LECTURE27	Multi DimensionalDataModel,
		LECTURE28	DataCubes, Stars,
		LECTURE29	SnowFlakes,
		LECTURE30	FactConstellations,Concept hierarchy,
		LECTURE31	Process Architecture,
		LECTURE32	3 TierArchitecture,DataMining.
5	AGGREGATION	LECTURE33	Aggregation
		LECTURE34	Historical information, Query Facility,
		LECTURE35	OLAP functionand Tools.
		LECTURE36	OLAPServers, ROLAP
		LECTURE37	MOLAP,HOLAP,
		LECTURE38	DataMining interface,
		LECTURE39	Security, Backup andRecovery,
		LECTURE40	Tuning DataWarehouse,TestingDataWarehouse.