VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2024-25 (ODD SEM)

SUBJECT	DIV	SUBJECT TEACHER	SYLLABUS
Theory of Computer Science (TCS)	A	Sunita Suralkar	**Basic Concepts and Finite Automata** 1.1 Importance of TCS, Alphabets, Strings, Languages, Closure properties, Finite Automata (FA) and Finite State machine (FSM) 1.2 Deterministic Finite Automata (DFA) and Nondeterministic Finite Automata (NFA): Definitions, transition diagrams and Language recognizers, Equivalence between NFA with and without ε-transitions, NFA to DFA Conversion, Minimization of DFA, FSM with output: Moore and Mealy machines, Applications and limitations of FA 2. **Regular Expressions and Languages** 2.1 Regular Expression (RE),Equivalence of RE and FA, Arden's Theorem, RE Applications 2.2 Regular Language (RL), Closure properties of RLs, Decision properties of **3 Grammars** 3.1 Grammars and Chomsky hierarchy 3.2 Regular Grammar (RG) 3.3 Context Free Grammars (CFG): Definition, Sentential forms, Leftmost and Rightmost derivations, Parse tree, Ambiguity, Simplification and Applications, Normal Forms: Chomsky Normal Forms (CNF) and Greibach Normal Forms (GNF), Context Free language (CFL) - Pumping lemma, Closure properties.
	B	Vidya Zope	
	C	Yugchhaya Dhote	
Software Engineering	A	Priti Joshi	**1.Introduction To Software Engineering and Process Models:** 1.1 Software Engineering-process framework, the Capability Maturity Model (CMM), Advanced Trends in Software Engineering 1.2 Prescriptive Process Models: The Waterfall, Incremental Process Models, Evolutionary Process Models: RAD & Spiral 1.3 Agile process model **2Software** **Requirements Analysis and Modelling:** 2.1 Introduction to requirement gathering :Requirement gathering techniques - Open ended and close ended questionnaires, Survey, Joint Application Design, Functional and non-functional requirements, user requirements, system requirements, interface specification 2.2 Structured Modeling : Data flow diagram, Deployment Diagram. Behavioural Modeling - Sequence Diagram, Use case Diagram, State Transition Diagram.Software Requirement Specification document format(IEEE). **3.Software Estimation Metrics** 3.1 Software Metrics: LOC, FP, Introduction to Basic COCOMO model and COCOMO II Model. **4.Software Architecture and Design Patterns** 4.1 Design Patterns (According to industry specifications) Software design – cohesion – coupling – types of coupling and cohesion
	B	Sujata Khandaskar	
	C	Veena Trivedi	
Computer Network	A	Priyanka Shah	**Module 1 : Introduction to Networking** 1.1 Introduction to computer network, Network application, Evolution of Computer Network , Interconnection networking devices, Client and server and Peer to Peer Networks. 1.2 Transmission media: Electromagnetic Spectrum, Ranges of Transmission media, Physical Layer: Introduction, Network topology, Wired and Wireless Communication, Principles of Cellular Communication, Introduction to 2G, 3G, 4G and 5G technologies 1.3 Communication Service Primitives, Design issues for Layers Reference models: ISO-OSI Layered Architecture, TCP/IP Reference Models, Packet and Circuit Switching. **Module 2 : Data Link Layer** 2.1 Data Link Layer: Elementary Data Link protocols Design Issues: Framing, Error Control: Error Detection and Correction (Hamming Code, CRC, Checksum), Flow Control: Stop and Wait, Sliding Window (Go Back N, Selective Repeat) 2.2 Medium Access Control Sublayer: Channel Allocation problem, Multiple Access Protocol (Aloha, Carrier Sense Multiple Access (CSMA/CA, CSMA/CD),1-persistent , n-persistent, p-persistent CSMA, Wired LANS: Ethernet, Ethernet Standards, Introduction to Wireless LAN, Bluetooth & ZigBee **Module 3 :** 3.1 Internet Protocol, IP header format, Network Addressing: IPV4 Addressing, Special Addresses, Various Classes of Network Addresses, Physical address, Mapping of Physical Address to Network Addresses, Classless Addressing: Subnet, Supernet, NAT 3.2 Network Layer design issues, Communication Primitives, Unicast, Multicast, Broadcast.
	B	Nusrat A	
	C	Pallavi G	
Data Warehousing and Mining	A	Priya .R.L	**Module 1: Data Warehousing Fundamentals** Introduction to Data Warehouse, Data warehouse architecture, Data warehouse versus Data Marts, Top-down versus Bottom-up approach, E-R Modeling versus Dimensional Modeling, Information Package Diagram, Data Warehouse Schemas; Star Schema, Snowflake Schema, Factless Fact Table, Fact Constellation Schema. Slowly Changing Dimension **Module 2: ETL & OLAP** Major steps in ETL process, Data extraction: Techniques, Data transformation: Basic tasks, Major transformation types, Data Loading: Applying Data, OLTP Vs OLAP, OLAP definition, Dimensional Analysis, Hypercubes, OLAP operations: Drill down, Roll up, Slice, Dice and Rotation, OLAP models: MOLAP, ROLAP. **Module 3: Introduction to Data Mining, Data Exploration and Data Pre-processing** Data Mining Task Primitives, Architecture, KDD process, Issues in Data Mining, Applications of Data Mining, Data Exploration: Types of Attributes, Statistical Description of Data, Data Visualization, Data Preprocessing: Descriptive data summarization, Cleaning, Integration & transformation, Data reduction, Data Discretization and Concept hierarchy generation
	B	Richard Joseph	
	C	Dr. Prashant Kanade	

Internet Programming (Elective)	A	Pallavi Saindane / Prerna S.	**Module No.: 01 Introduction to Web Essentials and UI Design** Web Essentials: Clients, Servers and Communication, Web System Architecture, HTTP Request Message, HTTP Response Message
	B	Pallavi Saindane / Prerna S.	**Module No.: 02 Front End Web Technologies** HTML5 – Fundamental syntax and semantics, Tables, Lists, Image, HTML5 control elements, Semantic elements, Drag and Drop, Audio , Video controls. CSS3 – Inline, embedded and external style sheets – Rule cascading, Inheritance, Backgrounds, Border Images, Colors, Shadows, Text, Transformations, Transitions, Animation. Java Script: An introduction to DHTML, JavaScript DOM Model, Built-in objects, Validation, Event Handling,
	C	Pallavi Saindane / Prerna S.	**Module No.: 03 Back End Development** Introduction to PHP- Data types, control structures, built in functions
Probabilistic Graphical Models	A	Sanjay Mirchandani	**Module 1: Introduction to Probabilistic Graphical Modeling** 1.1 Introduction to Probability Theory: Probability Theory, Basic Concepts in Probability, Random Variables and Joint Distribution, Independence and Conditional Independence, Continuous Spaces, Expectation and Variances 1.2 Introduction to Graphs: Nodes and Edges, Subgraphs, Paths and Trails, Cycles and Loops 1.3 Introduction to Probabilistic Graph Models: Bayesian Network, Markov Model, Hidden Markov Model
	B		**Module 2: Bayesian Network Model and Inference** 2.1 Directed Graph Model: Bayesian Network-Exploiting Independence Properties, Naive Bayes Model, Bayesian Network Model, Reasoning Patterns, Basic Independencies in Bayesian Networks, Bayesian Network Semantics, Graphs and Distributions. Modeling: Picking variables, Picking Structure, Picking Probabilities, D- separation 2.2 Local Probabilistic Models: Tabular CPDs, Deterministic CPDs, Context Specific CPDs, Generalized Linear Models.
	C		**Module 3: Markov Network Model and Inference** 3.1 Undirected Graph Model : Markov Model-Markov Network, Parameterization of Markov Network, Gibb's distribution, Reduced Markov Network, Markov Network Independencies, From Distributions to Graphs, Fine Grained Parameterization, Over Parameterization