

P.T.V.A.'s

M.L. Dahanukar College of Commerce (Autonomous)

Teaching Plan: 2026- 27

Department: I.T.

Class: B.Sc. (I.T.)

Semester: V

Subject: Advanced Web Applications

Name of the Faculty: Ms. Snehal Borlikar

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	UNIT I - .NET Framework and C# Fundamentals .NET Platform Overview: Evolution of .NET (.NET Framework → .NET Core → .NET 8+) Architecture of .NET, .NET Languages (C#, VB.NET – overview) CLR, CTS, .NET Class Library, Managed vs Unmanaged Code, Introduction to Visual Studio / VS Code. C# Programming Fundamentals: Structure of a C# Program, Variables, Constants, Data Types Operators and Expressions, Conditional Statements and Loops, Methods and Parameter Passing. Types, Objects and Namespaces: The Basics About Classes, building a Basic Class, Value Types and Reference Types, Understanding Namespaces and Assemblies, Advanced Class Programming.		15
July	UNIT II -Web Development with ASP.NET Core: Introduction: ASP.NET vs ASP.NET Core, MVC Architecture, Anatomy of ASP.NET Core Application, Project Structure and Configuration. Building Web Applications: Controllers and Actions, Routing, Models and Model Binding, Views and Razor Syntax. <u>Form Handling and Controls</u> : Tag Helpers, Form Controls and Validation, List and Table Display using Razor, Partial Views and Layouts, Routing, Menu and Navigation Design		12
August	UNIT III -State Management, UI Development and Debugging: State Management: Client-side vs Server-side State, Sessions, Cookies (creation and types), View Data and TempData. UI Development: Bootstrap Fundamentals, Grid System and Layout, Forms and Components. Debugging and Error Handling: Exception Handling Techniques, Logging Basics.		10
September	Module IV: UNIT IV -Data Access, Security and Deployment: Data Access: ADO.NET Overview, Data Providers Connected and Disconnected Architecture SQL Commands and Queries. Entity Framework Core: ORM concepts, dB Context, entities, CRUD operations and LINQ Queries. Security and Development tools: Security Concepts in Web Applications Authentication and Authorization, Role-, based Access (Overview), NuGet Package Manager, Application publishing and hosting.		8

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Semester: V

Subject: New Age Technologies

Name of the Faculty: Mrs. Supritha Bhandary

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Big Data: Introduction to Big Data, Three Vs of Big data, usage of Big data, Big data Challenges NoSQL: Definition, ACID Vs BASE, CAP Theorem, Advantages and Disadvantages, MongoDB data Model: JSON and BSON, Capped collection, Schema Evolution Introducing MongoDB: Non-Relational approach, SQL comparison		12
July	Using MongoDB shell, creating collection, MapReduce, aggregate (), Conditional operators, MongoDB document Data Model Approach. MongoDB Architecture, Standalone Deployment, Cluster Architecture, MongoDB Storage engine: Data storage Engine, data file, GridFS, Indexing, types of indexes. sharding, managing the data.		16
August	MongoDB Limitations, MongoDB Best Practices, the End of Disk? SSD AND In-Memory Databases: Solid State Disk, the Economics of Disk, SAP HANA, JSON: Introduction, JSON Grammar, JSON Vs XML, Data Interchanging, JSON HTML, JSONP		14
September	Node.js Introduction Feature of Node.js Components of Node.js introduction to npm, Connecting Node.js with MongoDB.		03

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Teaching Plan: 2026- 27

Department: I.T. Class: B.Sc. (I.T.) Semester: V

Subject: Network Foundation of Artificial Intelligence

Name of the Faculty: Mrs. Snehal Borade

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Unit I :- Introduction: What is Artificial Intelligence? Foundations of AI, history, the state of art AI today. Intelligent Agents: agents and environment, good behaviour, nature of environment, the structure of agents.		14
July	Unit II: -Solving Problems by Searching: Problem solving agents, searching for solutions, uninformed search, informed search strategies, heuristic functions. Beyond Classical Search: local search algorithms, searching with non-deterministic action, searching with partial observations, online search agents and unknown environments.		12
August	Unit III:- Adversarial Search: Games, optimal decisions in games, alpha-beta pruning, stochastic games, partially observable games. Logical Agents: The Wumpus world, propositional logic, propositional theorem proving. First Order Logic: Need for First Order Logic, Difference between Propositional and First Order Logic. Knowledge engineering in First Order Logic		10
September	Unit IV:- Inference in First Order Logic: Unification and lifting, forward and backward chaining, resolution. Artificial Neural Network: Architecture of ANN, merits and demerits of ANN, types of ANN. Generative AI: Generative AI History, AI vs Generative AI, benefits of generative AI.		09

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Teaching Plan: 2026- 27

Department: I.T.

Class: B.Sc. (I.T.)

Semester: V

Subject: Internet of Things

Name of the Faculty: Ms. Shruti Save

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	<u>Module I:</u> Fundamentals of IoT: Introduction, definition and characteristics of IoT, basic components of an IoT system, smart object concept, IoT conceptual framework, IoT architectural view, IoT communication models, M2M communication and its relationship with IoT, applications of IoT, benefits and challenges of IoT. Sensors and Actuators: Introduction to sensors and actuators, classification of sensors, characteristics of sensors (accuracy, precision, sensitivity, range, resolution)		10
July	<u>Module I:</u> Sensors and Actuators: Working principles of common IoT sensors, actuators and their types, role of sensors and actuators in IoT systems, interfacing sensors and actuators with IoT Devices. <u>Module II:</u> Embedded computing basics: Microcontrollers, System-on-chips (SoC), selection of platform. IoT Development Boards: Overview of Arduino platform, Arduino architecture and features, types of Arduino boards, Arduino development environment (Arduino IDE – overview), overview of Raspberry Pi, Raspberry Pi architecture and features, comparison between Arduino and Raspberry Pi, role of Arduino and Raspberry Pi in IoT applications. Interfacing and IoT System Integration: Interfacing sensors and actuators with microcontrollers and development boards, digital and analog input/output concepts, communication interfaces (UART, I2C, SPI – overview), introduction to GPIO, power considerations in IoT devices, basic IoT system design using development boards.		14

August	<u>Module III:</u> IoT Communication Technologies: Introduction to IoT communication, IoT communication technologies – Wi-Fi (IEEE 802.11), Bluetooth (IEEE 802.15.1), Zigbee (IEEE 802.15.4), 6LoWPAN (IEEE 802.15.4), RFID, Near Field Communication (NFC), characteristics of IoT communication technologies, applications of IoT communication technologies. IoT communication Models and Protocol : IoT communication models request–response and publish–subscribe, REST-based communication in IoT, Polling and long polling, MQTT protocol, WebSocket communication, comparison of IoT communication protocols.		12
September	<u>Module IV :</u> IOT data collection and Acquisition: Sources of IoT data, data acquisition process in IoT systems, sensor data sampling (periodic and event-driven), analog-to-digital data acquisition (conceptual), data aggregation, data transmission flow in IoT systems (device to gateway to application), challenges in IoT data collection. IoT Data Handling and Analytics: Types of IoT data, characteristics of IoT data (volume, velocity, variety), data storage in IoT systems (device, gateway, cloud – conceptual), challenges in IoT data handling. Introduction to IoT data analytics, need for analytics in IoT, descriptive analytics (overview), applications of data analytics in IoT.		11

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Semester: V

Subject: Project Management

Name of the Faculty: Ms. Anju Rai

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	<u>Module I :</u> Unit -1: Introduction to Software Project Management: Introduction, Why is Software Project Management Important? What is a Project? Software Projects versus Other Types of Project, Contract Management and Technical Project Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Some Ways of Categorizing Software Projects, Project Charter, Stakeholders, Setting Objectives, The Business Case, Project Success and Failure, What is Management? Management Control, Project Management Life Cycle, Traditional versus Modern Project Management Practices. Project Evaluation and Programme Management: Introduction, Business Case, Project Portfolio Management, Evaluation of Individual Projects, Cost–benefit Evaluation Techniques, Risk Evaluation, Programme Management, Managing the Allocation of Resources within Programmes, Strategic Programme Management, Creating a Programme, Aids to Programme Management, Some Reservations about Programme Management, Benefits Management.		06
July	<u>Module I:</u> Unit 1: An Overview of Project Planning : Introduction to Step Wise Project Planning, Step 0: Select Project, Step 1: Identify Project Scope and Objectives, Step 2: Identify Project Infrastructure, Step 3: Analyze Project Characteristics, Step 4: Identify Project Products and Activities, Step 5: Estimate Effort for Each Activity, Step 6: Identify Activity Risks, Step 7: Allocate Resources, Step 8: Review/Publicize Plan, Steps 9 and 10: Execute Plan/Lower Levels of Planning . <u>Module II:</u> Unit -2: Software Effort Estimation: Introduction, Where are the Estimates Done? Problems with Over- and Under-		14

	Estimates, The Basis for Software Estimating, Software Effort Estimation Techniques, Bottom-up Estimating, The Top-down Approach and Parametric Models, Expert Judgement, Estimating by Analogy, Albrecht Function Point Analysis, Function Points Mark II, COSMIC Full Function Points, COCOMO II: A Parametric Productivity Model, Cost Estimation, Staffing Pattern, Effect of Schedule Compression, Capers Jones Estimating Rules of Thumb.		
August	Activity Planning: Introduction, Objectives of Activity Planning, When to Plan, Project Schedules, Projects and Activities, Sequencing and Scheduling Activities, Network Planning Models, Formulating a Network Model, Adding the Time Dimension, The Forward Pass, Backward Pass, Identifying the Critical Path, Activity Float, Shortening the Project Duration, Identifying Critical Activities, Activity-on-Arrow Networks. Risk Management: Introduction, Risk, Categories of Risk, Risk Management Approaches, A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Evaluating Risks to the Schedule, Boehm's Top 10 Risks and Counter Measures, Applying the PERT Technique, Monte Carlo Simulation, Critical Chain Concepts. Resource Allocation: Introduction, Nature of Resources, Identifying Resource Requirements, Scheduling Resources, Creating Critical Paths, Counting the Cost, Being Specific, Publishing the Resource Schedule, Cost Schedules, Scheduling Sequence.		10

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Semester: V

Subject: Computational Thinking in Indian Knowledge Systems

Name of the Faculty: Mrs. Vibhuti Barad

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Introduction to Indian Knowledge System: Meaning, scope and significance of Indian Knowledge System (IKS), historical development of knowledge in India, relevance of IKS in modern science and technology. Knowledge Systems and Education: Ancient Indian education system, Gurukul system, knowledge dissemination, ancient universities such as Nalanda and Takshashila.		6
July	Indian Contributions to Mathematics and Computation: Development of numbers and concept of zero, decimal number system, contributions of Aryabhata, Brahmagupta and Bhaskaracharya, mathematical thinking and its relevance to modern computing. Indian Logic and Structured Thinking: Introduction to Nyaya philosophy, principles of logical reasoning and inference, relationship between Indian logic and modern computational logic.		8
August	Panini Grammar and Computational Linguistics: Structure of Sanskrit grammar, rule-based grammar system of Panini, relevance to programming languages and compiler design. Sanskrit and Natural Language Processing: Features of Sanskrit suitable for NLP, applications of computational linguistics in AI systems. Knowledge Representation in Indian Philosophy: Concept of knowledge representation in Nyaya and other philosophical systems, comparison with knowledge representation in Artificial Intelligence.		8
September	AI and Data Science for Indian Knowledge Preservation: Digitization of manuscripts, use of AI and data science for preservation and analysis of traditional knowledge. Ethical Values from Indian Philosophy in AI: Concepts of Dharma and ethical decision making, responsible use of AI and technology.		8

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