DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VALUE ADDED COURSE
ON

Machine Learning Application using IBM Cloud and Watson Studio

B.Tech: **II** Semester: **I** Academic Year: **2022–23**

Course Objectives

1. To understand the fundamentals of IBM Cloud, Artificial Intelligence, and Machine Learning technologies.
2. To learn how to use IBM Watson Studio for data management, visualization, model building, training, and deployment.
3. To develop cloud-based applications using Node-RED and Cloudant Database services.
4. To explore IBM Watson cognitive services and integrate them into intelligent applications.
5. To design, develop, test, and deploy end-to-end cognitive applications on the IBM Cloud platform.

SYLLABUS

Unit – I: IBM Cloud and AI Fundamentals
Introduction and Prerequisites, Overview of IBM Cloud Platform, Introduction to Artificial Intelligence, Fundamentals of Machine Learning, Types of Machine Learning, and IBM Watson Studio Overview.

Unit – II: IBM Watson Studio for Machine Learning
IBM Watson Studio Environment Setup, Working with Projects in IBM Watson Studio, Data Upload and Management in Watson Studio, Data Visualization in Watson Studio, Machine Learning with Watson Studio, Building Your First Machine Learning Model, Model Training and Evaluation, and Deploying Machine Learning Models.

Unit – III: Node-RED and Cloud Database Integration
Introduction to Node-RED, Node-RED Installation and Environment Setup, Creating Flows in Node-RED, Integrating Node-RED with IBM Cloud Services, Introduction to Cloudant Database, Creating and Managing Cloudant Databases, and CRUD Operations in Cloudant Database.

Unit – IV: IBM Watson Services and Cognitive Computing
IBM Technology Support Services, Introduction to IBM Watson Services, Tone Analyzer Fundamentals, Building Applications with Tone Analyzer, Cognitive Computing Concepts, and Integration of Watson Services in Applications.

Unit – V: Cognitive Application Development and Deployment
Creating a Cognitive News Search Application – Part 1, Creating a Cognitive News Search Application – Part 2, End-to-End Cognitive Application Development, Project Testing and Deployment, Query Session and Review, and Project Presentation.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VALUE ADDED COURSE
ON
Flutter Frame work

B.Tech: **III** Semester: **I** Academic Year: **2022–23**

Course Objectives

1. To understand the fundamentals of Flutter and Dart programming for cross-platform application development.
2. To design responsive and interactive user interfaces using Flutter widgets, layouts, and navigation techniques.
3. To implement efficient state management, form handling, theming, and application logic.
4. To integrate APIs, local storage, animations, and third-party packages into Flutter applications.
5. To test, debug, deploy, and maintain Flutter applications across mobile, web, and desktop platforms.

SYLLABUS

Unit – I: Dart Programming Fundamentals
Flutter Basics, Introduction to Dart Programming Language, Understanding Dart Syntax and Features, Dart Variables and Data Types, Operators in Dart, Functions in Dart, and Classes and Object-Oriented Programming in Dart.

Unit – II: Flutter UI Development
Introduction to Widgets, Stateless Widgets, Stateful Widgets, Building Blocks of a Flutter App, Layouts in Flutter, Rows, Columns, and Containers, Navigation Basics, and Drawer and Tab-Based Navigation.

Unit – III: State Management and App Functionality
State Management Fundamentals, Provider Package for State Management, Advanced State Management Techniques, State Management Solutions (Bloc, Riverpod, etc.), Forms and Validation, Themes and Styling, and Theming Your App.

Unit – IV: Data Handling and Advanced Features
Networking and API Integration, Local Data Storage, Internationalization and Localization, Animations in Flutter, Packages and Plugins, and Platform-Specific Code.

Unit – V: Testing, Deployment, and Cross-Platform Development
Testing and Debugging, Deployment, Web and Desktop Support, Flutter Project Development, Application Optimization Techniques, and Project Presentation & Review.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VALUE ADDED COURSE
ON

Quantum Computing

B.Tech: **II & III** Semester: **II** Academic Year: **2022–23**

Course Objectives

1. To understand the fundamental principles of quantum computing and the concepts of quantum mechanics relevant to computation.
2. To learn quantum states, qubits, quantum gates, and circuit design techniques used in quantum systems.
3. To explore major quantum algorithms and their applications in solving computational problems.
4. To understand quantum error correction, quantum cryptography, and the challenges of practical quantum computing.
5. To develop and implement quantum programs using Qiskit and analyze real-world applications and future trends in quantum computing.

SYLLABUS

Unit – I: Foundations of Quantum Computing
Introduction to Quantum Computing, History and Evolution of Quantum Computing, Classical Computing vs Quantum Computing, Fundamentals of Quantum Mechanics, Qubits and Quantum States, Quantum Superposition, Quantum Entanglement, Quantum Measurement, and Bloch Sphere Representation.

Unit – II: Quantum Gates and Circuits
Quantum Gates and Circuits, Single-Qubit Gates, Multi-Qubit Gates, Quantum Logic Operations, Quantum Circuit Design, Quantum Programming Concepts, and Introduction to Quantum Simulators.

Unit – III: Quantum Algorithms
Quantum Algorithms Overview, Deutsch-Jozsa Algorithm, Bernstein-Vazirani Algorithm, Simon's Algorithm, Grover's Search Algorithm, Shor's Factoring Algorithm, and Quantum Fourier Transform.

Unit – IV: Quantum Error Correction and Security
Quantum Error Correction, Quantum Noise and Decoherence, Quantum Cryptography, Quantum Key Distribution (QKD), Quantum Communication Fundamentals, and Security Applications of Quantum Computing.

Unit – V: Quantum Programming and Applications
Quantum Programming with Qiskit, Building Quantum Circuits with Qiskit, Quantum Computing Applications, Current Quantum Hardware and Platforms, Future of Quantum Computing, and Capstone Project.