Tribhuvan University

Faculty of Management

Office of the Dean

Course detail of
BIM (Bachelor of Information Management) 8th Semester

IT 248: IT Entrepreneurship and Management	3 Credit Hours
Elective II (Any one course of the Following)	3 Credit Hours
IT 275: .NET Programming	
IT 276: Database Administration	
IT 277: Cloud Computing	
IT 278: Big Data and Analytics	
IT 249: Business Intelligence	3 Credit Hours
IT 250: Digital Economy	3 Credit Hours
IT 350: Internship	3 Credit Hours

November 2025

IT 248: IT Entrepreneurship and Management

BIM 8th Semester

Nature of course: Information Technology and Computing

Credit hours: 3
Lecture hours: 48

Course Objective

The main objective of this course is to equip students with the knowledge and skills necessary to launch and manage successful IT-based startups. Through real-world case studies and experiential learning projects, students will gain practical insights into the challenges and opportunities in the ICT sector.

Course Description

This course is structured for a BIM program and focuses on the fundamentals of entrepreneurship, including idea generation, market research, business model development, and financial management. The course will also cover legal and regulatory considerations, marketing strategies, leadership, and corporate social responsibility.

Course Details

Unit 1: Foundations of Entrepreneurship **6 LHs**

Definition and Importance of Entrepreneurship Types of Entrepreneurs, Key Characters of Successful Entrepreneurs, Entrepreneurship Ecosystem, Role of ICT in Entrepreneurship, Case Study: Success story of e-Sewa or Khalti and its impact on fintech industries.

Unit 2: Idea Generation and Market Research **10 LHs**

Techniques for Creative Thinking, Market Needs Identification, Evaluating Business Ideas, Current Technology Trend Analysis, Prototyping Development, Defining Target Markets, Competitor Analysis Tools, Consumer Behavior Insight; Case Study: Pathao (Nepal) ride share services market entry strategies and adaptations

Unit 3: Business Model Development Crafting a Business Plan **10 LHs**

Business Model Canvas Framework, Identifying Revenue Sources, Cost Structure Analysis, Sustainability Business Models, Essential Elements of a Business Plan, Financial Projections Development, Marketing Strategy Formulation, Operational

Planning Essentials, Risk Management Strategies, Case Study: Business plans from emerging Nepali tech startups.

Unit 4: Legal and Regulatory Framework **6 LHs**

Concept of Nepali Business Laws for startups, Intellectual Property Rights (IPR), Licensing and Permits Required for Startups, Taxation Basics for Businesses, Compliance with Labor Laws, Case Study: Legal challenges faced by Nepali startups in the IT sector.

Unit 5: Financial Management and Marketing Strategies for Startups **10 LHs**

Funding Sources for Startups, Budgeting Techniques for New Ventures, Cash Flow Management Essentials, Financial Reporting Requirements, Developing a Marketing Strategy, Digital Marketing Techniques, Sales Techniques for Startups, Customer Relationship Management (CRM), Brand Building Essentials, Case Study: The marketing strategies that propelled MakeMyTrip's growth.

Unit 6: Leadership and Corporate Social Responsibility **6 LHs**

Leadership Styles in Entrepreneurship, Building Effective Teams, Conflict Resolution Techniques, Motivating Employees in Startups, Networking Skills for Entrepreneurs, Corporate Social Responsibility (CSR), Sustainability Practices for Startups, Ethical Marketing Strategies, Case Study: Tata Group’s CSR initiatives in India and their impact on society.

Suggested Readings

Feld, B., & Mendelson, J. (2012). *Venture deals: Be smarter than your lawyer and venture capitalist*. Wiley.

Horowitz, B. (2014). *The hard thing about hard things: Building a business when there are no easy answers*. Harper Business.

Kawasaki, G. (2015). *The art of the start 2.0: The time-tested, battle-hardened guide for anyone starting anything* (Rev. & expanded ed.). Portfolio/Penguin.

Kuratko, D. F. (2023). *Entrepreneurship: Theory, process, practice* (12th ed.). Cengage Learning.

Ries, E. (2011). *The lean startup: How today’s entrepreneurs use continuous innovation to create radically successful businesses*. Crown Business.

Thiel, P. (2014). *Zero to one: Notes on startups, or how to build the future*. Crown Business.

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IT249 Business Intelligence
BIM 8th Semester

Nature of course: Information Technology and Computing

Credit hours: 3
Lecture hours: 48

Course Objectives

This course aims to enable students to understand the role and importance of Business Intelligence (BI) in modern organizations, learning key concepts and techniques in data warehousing, data mining, and data visualization. They will gain hands-on experience with popular BI tools and technologies while developing the skills needed to analyze and interpret data to support effective decision-making processes.

Course Description

This course introduces the concepts, techniques, and tools used in business intelligence (BI) and data analytics. Students will learn how BI is used to transform data into insights for decision-making in organizations.

Course Details:

Unit 1: Introduction to Business Intelligence **5 LHs**

Definition and scope of BI; Importance of BI in decision-making; Overview of BI tools and technologies.

Unit 2: Data Warehousing **8 LHs**

Introduction to data warehousing concepts; Data warehouse architecture; ETL (Extract, Transform, Load) processes; Data modeling for BI.

Unit 3: Data Mining **8 LHs**

Introduction to data mining concepts; Data preprocessing techniques; Classification and clustering algorithms; Association rule mining.

Unit 4: Data Visualization **7 LHs**

Principles of data visualization; Tools and techniques for data visualization; Dashboard design and best practices

Unit 5: BI Tools and Technologies **12 LHs**

Overview of popular BI tools (e.g., Tableau, Power BI); Hands-on experience with BI tools for data analysis and reporting; Introduction to OLAP (Online Analytical Processing)

Unit 6: BI Implementation **8 LHs**

Best practices for implementing BI solutions; Challenges and considerations in BI implementation; Case studies of successful BI implementations

Laboratory Work

The laboratory work involves learning to use various Business Intelligence (BI) tools and technologies. It also includes implementing data warehousing, data mining, and data visualization techniques.

Suggested Readings

Sherman, R. (2014). *Business intelligence guidebook: From data integration to analytics*. Morgan Kaufmann.

Provost, F., & Fawcett, T. (2013). *Data science for business: What you need to know about data mining and data-analytic thinking*. O'Reilly Media.

Kimball, R., & Ross, M. (2013). *The data warehouse toolkit: The definitive guide to dimensional modeling*. Wiley.

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IT 250: Digital Economy

BIM 8th Semester

Nature of course: Information Technology and Computing

Credit hours: 3
Lecture hours: 48

Course Objectives

The course aims to enhance students' cognitive knowledge and practical skills in digital technologies in the field of economics and management.

Course Description

This course deals with the introduction to digital economy, fundamentals of digital economy, digital markets, strategy and innovation, digital transformation, economics of information, and digitalization from a Nepalese perspective.

Couse Details

Unit 1: Introduction **8 LHs**

Digital economics: concepts, drivers, and ecosystem; K-economy: concepts and drivers; Differences between digital economy and k-economy; The fourth industrial revolution: drivers, opportunities, and challenges; and Influence of digital economy: sustainability, privacy, regularity, and strategies.

Unit 2: Fundamentals of Digital Economy **7 LHs**

Multi-sided platforms: Network effects and positive feedback; Lock-in and switching costs; Formulation of monopolies in the digital economy; and Digital adoption index and OECD digital adoption government index.

Unit 3: Digital Markets, Strategy and Innovation **10 LHs**

Competition, cooperation, and competition; The layered internet model; Digital innovation; Digital business models; Value creation models; and Modeling of digital markets.

Unit 4: Digital Transformation **8 LHs**

Digital transformation: concepts and drivers; Accelerating SDGs through digital transformation; Role of technological revolution in the world economy; Globalization and economic growth in the digital age; and Digital currencies: concepts and types.

Unit 5: Economics of Information **8 LHs**

Asymmetric information: concepts and determinants; Asymmetric information and digitalization; Online search engines; Artificial intelligence; Strategy and the new economics of information; Effects of digitalization on consumer choice and labor markets; and Intellectual property and digitalization.

Unit 6: Digitalization in Nepalese Perspective **7 LHs**

E-governance: concepts, process, and structure; E-governance practices in Nepal; Digital financial inclusion in Nepalese financial markets; Opportunities and challenges for digital transformation in the public sector; Digital transformation and the economic performance in trade, tourism, agriculture, and SMEs.

Suggested Reading

Øverby, H., & Audestad, J. A. (2021). *Introduction to digital economics: Foundations, business models and case studies* (2nd ed.). Springer.

Maheshwari, A. (2019). *Digital transformation: Building intelligent enterprises*. Wiley.

Adhikari, G. M. (n.d.). *Digital economics* (Recent ed.). Kathmandu.

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IT 275: Dot Net Programming

BIM 8th Semester

Nature of course: Elective *Credit hours: 3*
Lecture hours: 48

Course Objectives

The main objective of this course is to explain the .NET Framework ecosystem for GUI application development, develop an understanding of object-oriented programming and C# language structure, and create user-friendly applications and functional web solutions.

Course Description

This course provides an intensive knowledge and skills to C#.NET programming, with an emphasis on ASP.NET web development and application development. The introductory course provides comprehensive coverage of critical principles, pragmatic methodologies, and optimal approaches that are essential for developing reliable and expandable software systems.

Course Details

Unit 1: Introduction to Dot NET **4 LHs**

Dot NET Framework: Features and Architecture, Dot NET Components: Common Language Runtime, Class Library, Dot NET Framework and .NET Core: A Comparative Overview, Visual Studio and Visual Studio Code IDE: Overview and Features, Setting up Visual Studio Development Environment, Leveraging IntelliSense for Efficient Coding, Project Types in .NET Development.

Unit 2: Basics of C# **12 LHs**

Concept of C# Data Types, Operators, and Variables, Control Statements: Flow Control in C#, Exploring Arrays and their Usage in C#, Object-Oriented Concepts: Classes, Structures, and Enumerations, Advanced Class Concepts: Partial, Static, and Sealed Classes, Constructors and Destructors in C#, Inheritance and Polymorphism: Concepts and Implementations, Interfaces: Defining and Implementing Interfaces in C#, Virtual Methods and Abstract Classes: Utilizing Polymorphism, Exception Handling: Strategies for Error Management in C#.

Unit 3: Delegates and String **6 LHs**

Delegates: Utilization and Implementation in C#, Lambda Expressions: Application and Integration in C#, Event Handling: Managing Events and Delegates for Asynchronous Tasks, String Manipulation: Techniques for Efficient String Operations, StringBuilder: Enhanced String Handling for Performance Optimization, Collections: Generic and Non-Generic Varieties in C#

Unit 4: Entity Framework and LINQ **6 LHs**

Entity Framework Introduction: Exploring its Purpose and Functionality, Database First Approach: Understanding and Implementing Database-Driven Development, Code First

Approach: Building Database Schema from Code, Model First Approach: Designing Data Models for Applications, LINQ Fundamentals: Introduction to Language Integrated Query, LINQ Implementation: Utilizing LINQ for Data Manipulation and Querying.

Unit 5: Introduction to ASP.NET **10 LHs**

ASP.NET vs ASP.NET Core, ASP.NET Frameworks for Web Applications: Web Forms, ASP.NET MVC, and ASP.NET Web Pages, creating a simple Web Forms application, Understanding ASP.NET MVC architecture, creating models, views, controllers and URL routing in ASP.NET MVC, creating a basic layout for ASP.NET Web Pages, Razor syntax for embedding code in HTML, Working with variables, loops and logical expressions, Database interaction with ASP.NET MVC

Unit 6: Database Programming **10 LHs**

Introduction to ADO.NET, ADO.NET architecture, DataReader, Dataset, DataTable and DataAdapter, Database Connection and working with Database Specific Classes (SqlConnection, SqlCommand, SqlTransaction), Accessing data with ADO.NET, implementing CRUD operations, Executing Commands (ExecuteNonQuery(), ExecuteReader(), ExecuteScalar()), Stored Procedure and working with Stored Procedures, Database, and Entity Framework.

Laboratory Works

Laboratory works should be done covering all the topics mentioned above. Each topic must be followed by a practical session. It must cover the Control Flow, Class and object, Static and Dynamic binding, Constructor and destructors, OOPs and implementation of key features, Delegates, Events and Lambda, Collections, Entity framework and LINQ, ASP.NET Frameworks for GUI applications, ADO.net and Entity framework related examples and lab work.

Suggested Readings

Albahari, J. (2022). *C# 10 in a nutshell* (1st ed.). O'Reilly.

Freeman, A. (2023). *Pro ASP.NET Core 7* (10th ed.). Manning Publications.

Skeet, J., & Lippert, E. (2019). *C# in depth* (4th ed.). Manning Publications.

Smith, J. P. (2021). *Entity Framework Core in action* (2nd ed.). Manning Publications.

Stellman, A., & Greene, J. (2021). *Head First C#: A learner's guide to real-world programming with C# and .NET Core* (4th ed.). O'Reilly Media.

Troelsen, A. W., & Japikse, P. (2022). *Pro C# 10 with .NET 6: Foundational principles and practices in programming* (11th ed.). Apress.

White, M. B. (2019). *Mastering C#: A step-by-step guide for the beginner*. *(Publisher not provided—add when known.)*

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IT 276: Database Administration

BIM 8th Semester

Nature of course: Elective *Credit hours: 3*
Lecture hours: 48

Course Objectives

The course is designed to help students understand the fundamental role, tasks, and responsibilities of a database administrator while gaining a solid understanding of Oracle database architecture. Students will learn how to install and configure an Oracle database and create essential database objects such as tables, views, and indexes, as well as write PL/SQL procedures. The course also prepares students to administer an Oracle database by creating and managing storage structures, managing user accounts, and performing essential backup and recovery operations. In addition, students will develop the skills needed to tune the Oracle database for improved performance and ensure efficient and reliable database operations.

Course Description

This course provides comprehensive knowledge about database administration, including DBA Roles and responsibilities, tablespace and storage management, DB backup, restoration, and recovery, security, multitenant, and performance tuning.

Course Contents

Unit 1: Introduction **10 LHs**

Introduction: Overview of the Oracle Database, Relational Database Concepts, Overview of Oracle Database Architecture, DBA Roles and Responsibilities, Overview of Oracle Data Guard, Oracle RAC, Oracle ASM, Oracle Cloud, Oracle Architecture: Oracle Database Architecture, Oracle Database Instance, Memory Structures, Process Architecture and Structures, Server and Client Processes, Database Storage Architecture, Connect to the Oracle Database Instance, Administer Database Instance: Administrative Tools Available to a DBA, Use SQL*Plus in Oracle to Manage a Database Instance, use SQL Developer to Manage a Database Instance, Working with Tables and Constraints, Working with Indexes, Views, Synonyms, and Sequences, Partitioning and Materialized Views, Administer the Database using Enterprise Manager (EM), Overview of the Enterprise Manager Framework, Enterprise Manager Cloud Control, Initialization Parameter Files.

Unit 2: Tablespace and Storage Structures **4 LHs**

Overview of Data Storage, the Database Block, Working with Tablespaces and Data Files, Creating and adding tablespace and datafiles, Managing Control Files, Online Redo Logs and Archive logs; Multiplexing.

Unit 3: Managing Users, Roles, and Privileges **5 LHs**

Manage Users: Predefined Database Administration Accounts, User Accounts, Create a User Account, User Authentication, Change a User's Password, Manage a User Account, Drop a User Account, Monitor User Information, Terminate User Sessions, Create a

Schema Only Account, Manage Privileges: Database Access, Oracle Supplied Roles, System and Object Level Privileges, the Grant and Revoke Commands, Create, Modify and Drop Roles, Use Predefined Roles, PL/SQL and Roles.

Unit 4: User Profiles, Resources, and Auditing **4 LHs**

Profiles And Resources: Overview of User Profiles, Profile Resource Parameters, Create Profile Command, Manage Passwords with Profiles, Control Resource Usage with Profiles, Maintain Profiles, Database Auditing: Overview of Database Security, Overview of Database Auditing, Security Compliance, Standard Auditing, Unified Audit Trail, Separation of Audit Responsibilities with the AUDIT_ADMIN And AUDIT_VIEWER Roles, Configure the Audit Trail, Specify Audit Options.

Unit 5: Configuration of Oracle Network Environment **5 LHs**

Overview of Network Configuration, Oracle Net Listener Configuration and Management, Oracle Net Naming Methods, Tools for Configuring and Managing the Oracle Network, using the Net Configuration Assistant, Configure Client Connections with Net Manager, View Listener Configuration, Start and Stop the Oracle Listener, use TNSPING to Test Oracle Net Connectivity, connect to the Database, Configure Net Services with Enterprise Manager.

Unit 6: Concurrency, Backup, and Recovery **8 LHs**

Concurrency: Levels of Locking in Oracle, Methods Used to Acquire Locks, Data Concurrency, Possible Causes of Contention, DML Locks, Prevent Locking Problems, Detect Lock Contention, Resolve Conflicts, Undo Management: Undo Data Overview, Monitor and Administer Undo, Configure Undo Retention, Switch Undo Tablespaces, Specify the Retention Period, Guarantee Undo Retention, Retention Period tor Flashback Queries, View Undo Space Information, use the Undo Advisor, Size the Undo Tablespace, Alter an Undo Tablespace to a Fixed Size, Backup and Recovery Overview, Database backup, restoration and recovery, backup and recovery strategy and options, Data Dump, User-Managed Backup and Recovery, Configuring RMAN, RMAN Backups, Restore and Recovery, High Availability Features, Understanding the Multitenant Architecture, Perform CBD and PBD flashback.

Unit 7: Database Maintenance, Performance Management, and Moving Data **8 LHs**

Database Maintenance: Overview, View the Alert Log, the Automatic Workload Repository, Statistic Levels, the Automatic Database Diagnostic Monitoring, Monitor an Oracle Database, use the Advisors, Set Up Notification Rules, Explain plan, Plan Hash value, Gather stat, Performance Management: Tuning Information Sources, Performance Monitoring, Tuning Activities, Performance Planning, Instance Tuning, Performance Tuning Methodology, Performance Tuning Data, Monitoring Performance, Managing Memory, Manage Private Temporary Tables, SQL Tuning, Cancel a SQL Statement in a Session, Oracle Optimizer, SQL Plan Directives, Adaptive Execution Plans, SQL Advisors, Automatic SQL Tuning Results, Moving Data: Create Directory Objects, Data Pump Architecture, Data Pump Data Dictionary Views, Data Pump Interactive Mode,

Data Pump API, use Data Pump to Export and Import Data, SQL Loader, Command Line Parameters, Record Filtering, Control File Keywords, SQL Loader Data Paths, External Tables.

Unit 8: Managing Resources and Scheduling Tasks **4 LHs**

Managing Resources: Overview of the Database Resource Manager, use the Resource Manager, Create Resource Plans, the Default Maintenance Resource Manager Plan, Create Resource Plan Directives, Allocate Resources for Resource Plans, Scheduling Tasks: Introduction to The Scheduler, Access Rights, Scheduler Components and Workflow, create a Job, Job Classes, use Time Based, Event Based Schedules, Create an Event Based Schedule.

Laboratory Works

Laboratory work should cover all the topics listed above.

Suggested Readings

Mannino, M. (2019). *Database design, application development, & administration* (7th ed.). Chicago Business Press.

Malcher, M., & Kuhn, D. (2024). *Pro Oracle Database 23c administration: Manage and safeguard your organization's data* (4th ed.). Apress.

Peasland, B. (2019). *Oracle DBA mentor: Succeeding as an Oracle database administrator*.

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IT277 - Cloud Computing
BIM 8th Semester

Nature of course: Elective *Credit hours: 3*
Lecture hours: 48

Course objectives

The main objectives of this course are to provide theoretical as well as practical knowledge of cloud computing, including designing, implementing, and managing cloud computing.

Course Description

This course provides both theoretical and practical knowledge of cloud computing. It covers key concepts and practices related to designing, implementing, and managing cloud-based systems. Students will learn about various cloud service models, deployment strategies, and management techniques essential for building efficient and scalable cloud solutions.

Course Details

Unit 1: Introduction to Cloud Computing **5 LHs**

Evolution of Cloud Computing, Characteristics of Cloud Computing, Types of Cloud and its Cloud services, Benefits and challenges of cloud computing, Applications of Cloud Computing, Cloud Storage, Cloud services requirements, Cloud and dynamic infrastructure, Cloud adoption.

Unit 2: Cloud Computing Architecture **5 LHs**

Platform as a service, Software as a service, Infrastructure as a service, Public clouds, Private clouds, Community cloud, Hybrid clouds, Cloud design and implementation using SOA, security, trust, and privacy.

Unit 3: Cloud Applications **5 LHs**

Migrating to the cloud, software licenses, Cloud cost model, service levels for cloud applications-security, web applications design.

Unit 4: Cloud Virtualization Technology **8 LHs**

Introduction to Virtualization, different types of Virtualization, Implementation Levels of Virtualization Structures, Benefits of virtualization, server virtualization, virtualization software, Types of Hypervisor, and Load balancing, Infrastructure requirement for virtualization.

Unit 5: MapReduce and Applications **7 LHs**

Parallel computing, MapReduce model, MapReduce applications, parallel efficiency of MapReduce, Enterprise batch processing using MapReduce.

Unit 6: Cloud Security **6 LHs**

Cloud Security issues, challenges, and Risks, Software-as-a-Service Security, Security Monitoring, Security Architecture Design, Data and application Security, Virtual Machine Security, Legal issues and Aspects, Multi-tenancy issues.

Unit 7: Cloud Platforms and Applications **12 LHs**

Web services, AppEngine, Azure Platform, Aneka, Open challenges, Scientific applications, Business and Consumer applications.

Laboratory Works

The practical work should cover all features of cloud computing.

Suggested Readings

Saurabh, K. (2017). *Cloud computing* (4th ed.). Wiley.

Buyya, R., Vecchiola, C., & Selvi, S. T. (2013). *Mastering cloud computing: Foundations and applications programming*. Morgan Kaufmann.

Linthicum, D. S. (n.d.). *Cloud computing and SOA convergence in your enterprise*.

Sosinsky, B. (n.d.). *Cloud computing bible*.

Saurabh, K. (2011). *Cloud computing: Insights into new era infrastructure*. Wiley India.

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IT278 Big Data and Analytics
BIM 8th Semester

Nature of course: Elective *Credit hours: 3*
Lecture hours: 48

Course Objective

The objective of this course is to provide knowledge of big data and related concepts to students. This course is designed to help students learn big data technologies, NoSQL systems, data lakes, and their applications.

Course Description

The course covers different concepts of big data technologies, including an overview and challenges of big data, big data analytics, Hadoop and NoSQL systems, data lakes, and big data applications.

Course Contents

Unit 1: Overview of Big Data **5 LHs**

Introduction; Types of Data; Evolution of Big Data; Big Data Characteristics; Big Data versus Data Warehouse; Advantages and Disadvantages of Big Data; Obstacles in Utilizing Big Data; Impact of Big Data.

Unit 2: Challenges of Big Data **6 LHs**

Introduction; Big Data Integration; Storing Big Data; Maintaining Data Quality; Analysis of Big Data; Security and Privacy Management; Accessing and Sharing.

Unit 3: Big Data Analytics **6 LHs**

Introduction; Applications of Big Data Analytics; Types of Big Data Analytics; Comparison of Data Analytics Stages

Unit 4: Hadoop and NoSQL Databases **14 LHs**

Introduction to Hadoop; Components of Hadoop Ecosystem; Data Storage Component; Data Processing Component; Data Access Component; Data Management Component; Apache Spark; Introduction to NoSQL Databases; Types of NoSQL Databases; Key-Value, Column-Oriented, Document Oriented and Graph-Based Databases; BASE Model; Advantages and Disadvantages of NoSQL Databases.

Unit 5: Data Lakes **7 LHs**

Introduction; Data Lake Architecture; Usage and Challenges; Advantages and Disadvantages; Lake House; Difference between Data Warehouse, Data Lakes, and Lake Houses; Best Practices.

Unit 6: Big Data Applications **10 LHs**

Big Data for Healthcare; Big Data Analytics of Fraud Detection; Big Data Analytics of Social Media; Novel Applications.

Laboratory Work

The laboratory work includes using Hadoop and any appropriate NoSQL database system to implement big data systems and related concepts.

Suggested Readings

Husain M.S. Khan M.Z. & Siddiqui T. (2024). *Big Data Concepts, Technologies and Applications*. First Edition. CRC Press.

Hammond-Errey M. (2024). *Big Data, Emerging Technologies and Intelligence: National Security Disrupted*. Routledge.

White T. (2015). *Hadoop: The Definitive Guide*. Fourth Edition. O'Reilly Media.

Fowler A. (2015). *NoSQL for Dummies*. Wiley.

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