



In Partnership With Diversity Learning Institute-DLI & Twikatane e.V Vermany

Bachelor of Science in Information technology B.Sc IT

Semester 1:

Module Name	Module Code	Teaching Hours	Credits
Introduction to IT	IT101	45	3
Computer Fundamentals	IT102	60	4
Programming Fundamentals	IT103	60	4
Mathematics for IT	IT104	45	3
Communication Skills	IT105	30	2
Digital Logic and Circuits	IT106	45	3

Semester 2:

Module Name	Module Code	Teaching Hours	Credits
Data Structures and Algorithms	IT201	60	4
Database Management Systems	IT202	60	4
Object-Oriented Programming	IT203	45	3
Computer Networks	IT204	45	3
Web Development	IT205	45	3
Operating Systems	IT206	45	3

Semester 3:

Module Name	Module Code	Teaching Hours	Credits
Software Engineering	IT301	60	4
Systems Analysis and Design	IT302	60	4
Cybersecurity	IT303	45	3
Database Design and Implementation	IT304	45	3
Web Technologies	IT305	45	3
Elective 1	IT306	45	3

Semester 4:

Module Name	Module Code	Teaching Hours	Credits
Mobile App Development	IT401	60	4
Cloud Computing	IT402	60	4
IT Project Management	IT403	45	3
Computer Graphics	IT404	45	3
Data Mining and Warehousing	IT405	60	4
Elective 2	IT406	45	3

Semester 5:

Module Name	Module Code	Teaching Hours	Credits
Artificial Intelligence in IT	IT501	60	4
Internet of Things (IoT)	IT502	45	3
IT Ethics and Professionalism	IT503	30	2
Advanced Database Management	IT504	45	3
IT Governance and Compliance	IT505	45	3
Elective 3	IT506	45	3

Semester 6:

Module Name	Module Code	Teaching Hours	Credits
Big Data Analytics	IT601	60	4
Network Security	IT602	45	3
Capstone Project	IT603	90	6
IT Innovation and Emerging Technologies	IT604	45	3
Elective 4	IT605	45	3
Elective 5	IT606	45	3

Elective Modules:

1. IT306 - Linux System Administration
2. IT406 - Human-Computer Interaction
3. IT506 - Blockchain Technology
4. IT605 - Cloud Security
5. IT606 - IT Entrepreneurship

Module Outline:**Module 1: Introduction to IT (IT101)**

1. Evolution of Information Technology
2. Basic Computer Architecture
3. Software and Hardware Components
4. Overview of Operating Systems
5. IT Career Paths and Specializations
6. Ethical Considerations in IT

Module 2: Computer Fundamentals (IT102)

1. Binary System and Number Representation
2. Computer Organization and Architecture
3. Input and Output Devices
4. Storage Devices and Media
5. Computer Networks Overview
6. Computer Security Fundamentals

Module 3: Programming Fundamentals (IT103)

1. Introduction to Programming Concepts
2. Basics of Algorithms and Flowcharts
3. Programming Logic and Control Structures
4. Data Types and Variables
5. Functions and Procedures
6. Debugging and Testing Techniques

Module 4: Mathematics for IT (IT104)

1. Discrete Mathematics for Computing
2. Linear Algebra for IT Applications
3. Calculus and Its Applications in IT
4. Probability and Statistics in IT
5. Mathematical Logic
6. Graph Theory and Its Relevance to IT

Module 5: Communication Skills (IT105)

1. Written Communication for IT Professionals
2. Oral Communication and Presentation Skills
3. Technical Documentation and Report Writing
4. Communication in a Global IT Environment
5. Team Communication and Collaboration
6. Effective Communication in IT Projects

Module 6: Digital Logic and Circuits (IT106)

1. Boolean Algebra and Logic Gates
2. Combinational and Sequential Circuits
3. Digital Components and Integrated Circuits
4. Memory Systems in Digital Electronics
5. Microprocessor Architecture
6. Assembly Language Programming

Note: The following modules continue in a similar format, covering core IT topics.

Module 7: Data Structures and Algorithms (IT201)

1. Abstract Data Types
2. Stacks and Queues
3. Linked Lists and Trees
4. Sorting and Searching Algorithms
5. Dynamic Programming
6. Graph Algorithms

Module 8: Database Management Systems (IT202)

1. Introduction to Databases
2. Relational Database Concepts
3. SQL Programming
4. Normalization and Database Design
5. Transaction Management
6. Database Security and Backup

Module 9: Object-Oriented Programming (IT203)

1. Object-Oriented Concepts
2. Classes and Objects
3. Inheritance and Polymorphism
4. Encapsulation and Abstraction
5. Exception Handling
6. Design Patterns in Object-Oriented Programming

The pattern continues for subsequent modules.

Module 10: Computer Networks (IT204)

1. Introduction to Networking
2. OSI Model and TCP/IP Protocol Suite
3. Network Topologies and Technologies
4. Routing and Switching
5. Network Security
6. Wireless and Mobile Networking

Module 11: Web Development (IT205)

1. HTML, CSS, and JavaScript
2. Web Design Principles
3. Server-Side Scripting (e.g., PHP, Python, or Node.js)
4. Database Integration in Web Development
5. Web Security Best Practices
6. Responsive Web Design

Module 12: Operating Systems (IT206)

1. Introduction to Operating Systems
2. Process Management and Scheduling
3. Memory Management
4. File Systems
5. Device Management
6. Operating System Security

The pattern continues for the subsequent semesters and modules.

(1) How AI can be applied in this course:

In the "AI in Information Technology" module, students will delve into the application of Artificial Intelligence (AI) within the context of Information Technology. The module may cover the following areas:

Automated IT Operations:

- Exploration of AI-driven tools for automating routine IT operations, such as system monitoring, log analysis, and incident response.
- Hands-on experience with AI-powered IT management platforms.

Predictive Maintenance:

- Understanding how AI can be used for predicting hardware failures and optimizing maintenance schedules in IT infrastructure.
- Case studies on the application of predictive analytics in preventing system downtime.

AI in Cybersecurity:

- Exploration of AI algorithms for threat detection and intrusion prevention.
- Hands-on exercises in utilizing machine learning for identifying and responding to cyber threats.

Natural Language Processing (NLP) in IT:

- Examining the use of NLP in IT for processing and understanding human language.
- Implementation of NLP algorithms for IT-related tasks such as chatbots and IT helpdesk support.

AI in Network Management:

- Utilizing AI for optimizing network performance, identifying bottlenecks, and predicting network congestion.
- Hands-on experience with AI-driven network monitoring and optimization tools.

IT Service Desk Automation:

- Integration of AI-powered virtual assistants for IT service desk tasks, including ticket routing, issue resolution, and user support.
- Case studies on the successful implementation of AI in IT service management.

(2) Advantages of applying AI in this course:**Increased Operational Efficiency:**

- AI automates routine tasks, allowing IT professionals to focus on more strategic and complex aspects of their roles, thereby increasing overall operational efficiency.

Enhanced Security Measures:

- AI enhances cybersecurity by providing advanced threat detection capabilities, identifying patterns indicative of potential security breaches, and responding proactively to emerging threats.

Improved Predictive Maintenance:

- AI algorithms can predict equipment failures and optimize maintenance schedules, reducing downtime and minimizing disruptions to IT services.

Optimized IT Infrastructure:

- AI-driven tools analyze large datasets to optimize IT infrastructure, improving resource allocation, network performance, and overall system efficiency.

Better User Support and Experience:

- AI-powered virtual assistants and chatbots can provide instant and personalized support to users, improving the overall IT service desk experience.

Data-Driven Decision Making:

- AI in IT enables data-driven decision-making, providing IT professionals with insights derived from large datasets to make informed choices about system optimization, security, and resource allocation.

Future-Proofing IT Professionals:

- Exposure to AI in Information Technology prepares students for the evolving landscape of IT, ensuring they are equipped with the skills needed to adapt to technological advancements in the field.

By integrating AI into the Information Technology curriculum, students gain a holistic understanding of how AI can be leveraged to enhance IT operations, cybersecurity, and user support. This knowledge equips them with a competitive advantage in the IT industry and prepares them for the ongoing evolution of technology.