Bachelor of Science - Information Technology

Programme Structure

Sub Code	Subject Name	Credit	
		Theory	Practical
Semester – I			
BSCIT-101	Communication Skills	4	
BSCIT-102	Introduction to Programming using C	4	2
BSCIT-103	Office Automation Tools	4	2
BSCIT-104	Fundamental of Operating System	4	2
BSCIT-105	Computer Fundamentals	4	
		20	6
Semester – II			
BSCIT-201	Database Management System	4	2
BSCIT-202	Financial Accounting and Management	4	
BSCIT-203	Data Structure	4	2
BSCIT-204	Object Oriented Programming using C++	4	2
BSCIT-205	System Analysis and Design	4	
		20	6
Semester – III			
BSCIT-301	Relational Database Management System	4	2
BSCIT-302	Computer Networks	4	
BSCIT-303	Software Engineering	4	
BSCIT-304	Object Oriented Programming using Java (Core Java)	4	2
BSCIT-305	Introduction to Web Designing	4	2
		20	6
Semester – IV			
BSCIT-401	Digital Electronics	4	
BSCIT-402	Client Server Architecture and Interface	4	2
BSCIT-403	Computer Oriented Numerical Method	4	
BSCIT-404	Introduction to Algorithms	4	
BSCIT-405	Introduction to Python Programming	4	2
		20	4
Semester – V			
BSCIT-501	Advanced Java	4	2
BSCIT-502	Distributed Operating System	4	
BSCIT-503	Statistical Methods	4	
BSCIT-504	System Software	4	
		16	2
Semester – VI			
Elective-1	Any one of BSCIT-601 or BSCIT-602	4	
Elective-2	Any one of BSCIT-603 or BSCIT-604	4	
BSCIT-605	Internship cum Software Development Project - I		12
		8	12

List of Subjects for Elective-1

- BSCIT-601 : Introduction to Cyber Security
- BSCIT-602 : Introduction to IOT and It's Application

List of Subjects for Elective-2

- BSCIT-603 : Mobile Operating Systems
- BSCIT-604 : Social Media and Search Engine Optimization

Bachelor of Science - Information Technology Detailed Course Wise Syllabus

Course Name: Communication Skills

Course Code: BSCIT-101

Block	Detail syllabus
Block-1	The Seven Cs of Effective Communication: Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness Understanding Business Communication: Nature and Scope of Communication, Non-verbal Communication, Cross-cultural communication, Technology-enabled Business Communication
Block-2	Writing Business Messages and Documents: Business writing, Business Correspondence, Instructions Business Reports and Proposals, Career building and Resume writing. Developing Oral Communication Skills for Business: Effective Listening, Business Presentations and Public Speaking, Conversations, Interviews
Block-3	Developing Oral Communication Skills for Business: Meetings and Conferences, Group Discussions and Team Presentations, Team Briefing, Understanding Specific Communication Needs: Communication across Functional Areas
Block-4	Understanding Specific Communication Needs: Corporate Communication, Persuasive Strategies in Business Communication, Ethics in Business Communication, Business Communication Aids Presentation Process: Planning the presentations, executing the presentations, Impressing the audience by performing, Planning stage: Brainstorming, mind maps / concept maps, executing stage: chunking theory, creating outlines, Use of templates. Adding graphics to your presentation: Visual communication, Impress stage: use of font, colour, layout, Importance of practice and performance.

Course Name: Introduction to Programming using C

Course Code: BSCIT-102

Block	Detail syllabus
Block-1	• Information to C Language • Keyword • Variable and Constants • Data Type • Operators
Block-2	• Output, Input • Control statement • Loop • Nested control

	• Nested Loop
Block-3	• Array • String • Multidimensional Array • Functions
Block-4	• Structure • Pointer • File Management

Course Name: Office Automation Tools
Course Code: BSCIT-103

Block	Detail syllabus
Block-1	• Introduction to Computer • Fundamental Concept of Windows and Linux
Block-2	• Microsoft Word • Microsoft Excel • Microsoft Powerpoint
Block-3	• Network • Internet • Security
Block-4	• Maintenance

Course Name: Fundamental of Operating System
Course Code: BSCIT-104

Block	Detail syllabus
Block-1	• Introduction to Operating System • Operating System Structure
Block-2	• Processes • Threads • Process Scheduling • Process Synchronization and Deadlocks
Block-3	• Memory Management • Page Replacement Algorithms
Block-4	• File Systems Interface • File System Implementation • Mass Storage Structure • I/O Systems
Block-5	• Protection

	• Security

Course Name: Computer Fundamentals

Course Code: BSCIT-105

Block	Detail syllabus
Block-1	• Overview of computers, Operating Systems, and Applications. • Overview of Windows 10 Operating System, File System, and Snipping Tool.
Block-2	• Overview of Computer Networks, Internet, Browsers, and Cloud Computing. • Overview of Google Gmail, Contacts, Calendar, Google Drive, and OneDrive.
Block-3	• Overview of Computer Security and Key System Utilities (Defender, Disk Cleanup, Defrag, Task Manager & Backup).
Block-4	• Intro to Google Docs & OneDrive Word (Including File Format Converting). • Intro to Google Sheets and OneDrive Excel (Including File Format Converting). • Intro to Google Slides and OneDrive PowerPoint.

Course Name: Database Management System

Course Code: BSCIT-201

Block	Detail syllabus
Block-1	• Introduction to Database Systems • Database History • Data Modelling • Data Models
Block-2	• Relational Data Model • Entity Relationship Model • Integrity Rules and Constraints. • Relational Design and Redundancy
Block-3	• Functional Dependencies • Introduction to Data Normalization
Block-4	• Introduction to SQL • SQL – Data Manipulation Language • SQL – Join Statements • Database Development Process

Course Name: Financial Accounting and Management

Course Code: BSCIT-202

Block	Detail syllabus

Block-1	• Fundamentals of Accounting • Financial Statements
Block-2	• Accounting Ratio • Cash Flow Statement
Block-3	• Cost Concepts • Cost Sheet
Block-4	• Budgetary Control • Marginal Costing • Capital • Working Capital

Course Name: Data Structure
Course Code: BSCIT-203

Block	Detail syllabus
Block-1	• Introduction to Data Structure • Algorithms
Block-2	• Linked Lists • Stack • Queue
Block-3	• Searching • Sorting
Block-4	• Trees • Binary Search Tree • B-Tree • Graph

Course Name: Object Oriented Programming using C++
Course Code: BSCIT-204

Block	Detail syllabus
Block-1	• Introduction to Object Oriented Programming • Elements of C++ Language • Operators and Manipulators • Decision and Control Structures
Block-2	• Array, Pointer and Structure • Functions • Introduction to Classes and Objects
Block-3	• Constructors and Destructors • Operator Overloading
Block-4	• Inheritance • Virtual Functions and Polymorphism • File Handling

BSCIT-205 System Analysis and Design

Block	Detail syllabus
Block-1	• Basic Concept of Systems • Information System and System Analyst

Block-2	• System Development Life Cycle • System Planning and Information Gathering
Block-3	• Feasibility Study • Tools for System Analysis • System Design
Block-4	• Input and Output • System Implementation and Maintenance • System Security and Audit

Course Name: Relational Database Management System
Course Code: BSCIT-301

Block	Detail syllabus
Block-1	• Basic Concepts: data, database, database systems, Database management system: Introduction, Purpose and advantages of Database management system (over file systems). • Architecture of DBMS: Architecture of DBMS, Various components of DBMS. • Data models: Introduction, Data modeling and mapping. • Tables (relations), rows (tuples), domains, columns (attributes), Database design process, Anomalies in a database.
Block-2	• Functional Dependencies, Finding Candidate keys using Armstrong rules. • Stages of Normalization: 1NF, 2NF, 3NF, BCNF • ORACLE Server & Instances, Database Structure & Space Management, Memory & Process Structure, Schemas & Schema Objects, Client Server Architecture – Distributed Database Processing, Database Backup & Recovery, ORACLE Utility – Import , Export.
Block-3	• Basic Data Types of ORACLE, Data Definition Language (DDL), Data Manipulation Language (DML), Transaction Processing Language (TPL), Data Constraints, Inbuilt Functions, queries, Sub queries, Join, Indexes, Views, Sequences, and Synonyms. • ORACLE Database Object : Stored Procedures & Functions, • Packages, Triggers, Users – Create & Delete User, Grant & Revoke Command. • ORACLE Database Privileges & Roles: Privileges – System & Object Privileges, Assigning, Viewing, Revoking System & Object Privileges Roles – Create, Grant, View & Delete the Roles.
Block-4	• Introduction, Advantages of PL/SQL and Generic PL/SQL Block. • Cursor: Implicit & Explicit Cursor, Cursor For Loop, Parameterized Cursor. • Locking Strategy: Implicit & Explicit Locking, Lock Table. • Exception Handling: Predefine exceptions, Users define exceptions, Handling Raised exceptions.

Course Name: Computer Networks
Course Code: BSCIT-302

Block	Detail syllabus
Block-1	• Introduction to Networking, Components of Networking, Different Computing Models of Network • Intranets and Internets Network Services, FileServices, File Transfer Services, Printing Services, Application Services. • Fundamentals of communication theory

Block-2	• Introduction to Standards, Standard Organization and the OSI rules and the Communication Process. • The OSI reference Model • IEEE802 family standard.
Block-3	• Introduction to Transmission Media • Cable Media • Wireless Media • TCP/IP
Block-4	• Connectivity Devices • Network architectures • Topologies. • Switching & Routing In Networks

Course Name: Software Engineering
Course Code: BSCIT-303

Block	Detail syllabus
	• Definition of Software Engineering • Need for Software Engineering • Software Characteristics • Software Qualities
	• Definition of System Analysis, Requirement Analysis, System Analyst, • Knowledge and Qualities of System Analyst, Role of a System Analyst • Feasibility Study and Types, Fact Gathering, User Transaction • Requirement, User Design Requirements, SRS
Block-3	• System Development Methodologies • Analysis and Design Tools
Block-4	• Structured System Design • Software Testing

Course Name: Object Oriented Programming using Java (Core Java)
Course Code: BSCIT-304

Block	Detail syllabus
Block-1	• Introduction to Java, the Java Language Specification, API, JDK and IDE, Elementary Programming, Selection and Loops,
Block-2	• Mathematical Functions, Characters, and Strings, Methods and Arrays
Block-3	• Objects and Classes, Inheritance, Polymorphism, Abstract Classes and Interfaces, Exception Handling, Lists, Sets and Maps
Block-4	• Event-Driven Programming, Binary I/O, Sorting, Searching and Hashing Java Database Programming

Course Name: Introduction to Web Designing
Course Code: BSCIT-305

Block	Detail syllabus
Block-1	• Fundamental of Internet, Intranet and Extranet • Internet Terminology • Web Server and Protocols • Recent Internet Technology Applications
Block-2	• HTML Tags

	• Designing HTML Table • Designing HTML Forms • Designing HTML Frames
Block-3	• Cascading Style Sheet • Attributes of Cascading Style Sheet • Effects of Cascading Style Sheet • Other Effects of Cascading Style Sheet
Block-4	• Introduction to JavaScript • Functions and Dialog of JavaScript • Event , Method and Properties of JavaScript • Built In Function

Course Name: Digital Electronics
Course Code: BSCIT-401

Block	Detail syllabus
Block-1	• Boolean Algebra • Logic Gates • Simplification of Boolean Functions
Block-2	• Combinational Switching Circuits • Logic Families
Block-3	• Flip-flops • Shift Registers • Counters
Block-4	• Digital to Analog Converters • Analog to Digital Converters • Digital Memories

Course Name: Client Server Architecture and Interface
Course Code: BSCIT-402

Block	Detail syllabus
Block-1	• Client Server Computing: Functions of client, server, middleware components • Advantages and limitations of client server computing • Three Tier Architecture: Overview of thin client, application server, web server • Distributed Database • Real Application Clusters • High Performance Database Computing • Data Warehousing and Data Mining
Block-2	• Architecture of Oracle Database and Oracle Instance • Physical and Logical Structures • Dedicated and Shared Server Configuration • Oracle Server Startup and Shutdown • Creating Database
Block-3	• SQL • Pl/SQL Procedural Extension, • PL/SQL data types & Control Structures
Block-4	• Cursors, Stored Procedures & Functions

	• Database Triggers • Package Creation • Dynamic SQL • Collections & Objects

Course Name: Computer Oriented Numerical Method
Course Code: MCIT-403

Block	Detail syllabus
Block-1	• Computer Arithmatic • Solving Non-Linear Equations
Block-2	• Solving Simultaneous Linear Algebric Equations • Interpolation
Block-3	• Least Squares Approximation of Function • Approximation of Functions
Block-4	• Differentiation • Integration • Numerical Solution of Differential Equations

Course Name: Introduction to Algorithms
Course Code: BSCIT-404

Block	Detail syllabus
Block-1	• Overview of algorithms • Time and Space Complexity • Growth of Functions
Block-2	• Divide and Conqur • Probabilistic Analysis • Randomized Algorithms
Block-3	• Dynamic Programming • Greedy Algorithm • Amortized Analysis
Block-4	• Elementary Graph Algorithms • Minimum Spanning Trees • Single-Source Shortest Paths • Maximum Flow

Course Name: Introduction to Python Programming
Course Code: BSCIT-405

Block	Detail syllabus
Block-1	• Introuduction • Variable, Expression and Statement • Conditional Execution • Functions
Block-2	• Iteration • String • Files • Lists

Block-3	• Dictionaries • Tupels • Regular Expressions • Networked Program
Block-4	• Python and Web Service • Object-Oriented Programming • Using database and SQL • Visualizing Data

Course Name: Advanced Java

Course Code: MCIT-501

Block	Detail syllabus
Block-1	• Network Basics and Socket overview, TCP/IP client sockets, URL, TCP/IP server sockets, Datagrams, java.net package Socket, ServerSocket, InetAddress, URL, URLConnection
Block-2	• The JDBC Connectivity Model, Database Programming: Connecting to the Database, Creating a SQL Query, Getting the Results, Updating Database Data, Error Checking and the SQLException Class, The SQLWarning Class, The Statement Interface, PreparedStatement, CallableStatement The ResultSet Interface, Updatable Result Sets, JDBC Types, Executing SQL Queries, ResultSetMetaData, Executing SQL • Updates, Transaction Management.
Block-3	• Servlet Model: Overview of Servlet, Servlet Life Cycle, HTTP Methods Structure and Deployment descriptor ServletContext and ServletConfig interface, Attributes in Servelt, Request Dispacher interface. The Filter API: Filter, FilterChain, Filter ConfigCookies and Session Management: Understanding state and session, Understanding Session Timeout and Session Tracking, URL Rewriting
Block-4	• JSP Overview: The Problem with Servlets, Life Cycle of JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment

Course Name: Distributed Operating System

Course Code: MCIT-502

Block	Detail syllabus
Block-1	• Introduction to distributed Systems • Communication in Distributed System • Synchronization in distributed systems:
Block-2	• Processes and processors in distributed systems • Distributed File Systems: • Distributed Shared Memory
Block-3	• Naming • Distributed Web-Based System
Block-4	• Security • Case Study

Course Name: Statistical Methods

Course Code: MCIT-503

Block	Detail syllabus
Block-1	• Introduction to Statistics and Descriptive Statistics • Descriptive Statistics: Central Tendency • Grouped Data
Block-2	• Skewness • Measures of Association • Probability and Probability Distributions
Block-3	• Discrete Probability Distributions • Probability Distributions • Sampling, Sampling Distributions and Estimation • Estimation for Single Population
Block-4	• One Sample Hypothesis Tests • Regression

Course Name: System Software

Course Code: MCIT-503

Block	Detail syllabus
Block-1	• Overview of System Software, Introduction, Software, Software Hierarchy, Systems Programming, Machine Structure, Interfaces, Address Space, Computer Languages, Tools, Life Cycle of a Source Program, Different Views on the Meaning of a Program, System Software Development, Recent Trends in Software Development, Levels of System Software
Block-2	• Overview of Language Processors Programming Languages and Language Processors, Language Processing Activities, Program Execution, Fundamental of Language Processing, Symbol Tables Data Structures for Language Processing: Search Data structures, Allocation Data Structures.
Block-3	• Assemblers • Macro and Macro Processors • Linkers and Loaders • Scanning and Parsing
Block-4	• Compilers • Interpreters • Debugger

List of Subjects for Elective-1

Course Name: BSCIT-601

Course Name: Introduction to Cyber Security

Block	Detail syllabus
Block-1	• Cyber Security Essentials • Attack Vectors, Threat, Risk and Vulnerability • Advance Persistent Threat and Cyber Kill Chain • Cyber Security Framework

Block-2	• Firewall and Packet Filters • Introduction to Windows and Linux Firewall • Attacks on Wireless Networks
Block-3	• Scanning For Web Vulnerabilities Tools and HTTP Utilities • Application Inspection Tools • Password Cracking and Brute-Force Tools • Web Attack
Block-4	• Cyber Crimes • Internet crime and Act • Intellectual Property in the Cyber world

Course Name: BSCIT-602

Course Name: Inroduction to IOT and It's Application

Block	Detail syllabus
Block-1	• The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.
Block-2	• IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture-Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.
Block-3	• IoT Applications for Value Creations:Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.
Block-4	• Internet of Things Privacy, Security and Governance: • Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

List of Subjects for Elective-2

- BSCIT-603 : Mobile Operating Systems
- BSCIT-604 : Social Media and Search Engine Optimization

Course Name: BSCIT-603

Course Name: Mobile Operating System

Block	Detail syllabus
Block-1	• Generalize Operating System • Functionality Of Generalize Operating System • Operating System Structures • Mobile Computing
Block-2	• Mobile Devices • Function Of Mobile Operating System • Mobile Operating System • Generalized Mobile Operating System Architecture and Comparison
Block-3	• Basics of Android Operating System • Internal Mechanism of Android OS • ios Operating System
Block-4	• Windows Phone • Blackberry • Symbain

Course Name: BSCIT-604

Course Name: Social Media and Search Engine Optimization

Block	Detail syllabus
Block-1	• Introduction to SEO • Evolution of SEO
Block-2	• Current SEO Best Practices • SEO of Today, Tomorrow and Beyond
Block-3	• Introduction to Social Media • Social Media Technology • Critical Analysis of Social Media
Block-4	• Social Media Analytics • Ethical issues and social media cyber laws

Course Code: BSCIT-605

Course Name: Software Development Project

1. Basic Information

Semester	Course Code	Course Name	CP	TYPE
IV	BSCIT-605	Software Development Project	8	PR

Project Guidelines

A. Project Guide Eligibility Criteria:

Full Time Faculties in the Department of Computer Science/ Information Technology of BAOU/ Colleges/ Institutions affiliated to any Indian University recognized by UGC and having minimum 2 years teaching experience.

OR

A person having minimum M. Tech, MCA, M.Sc. in Computer Science/Information Technology from a UGC recognized universities with 4 years' experience in Industry/teaching.

B. Type of Project

Learner may choose any topics according to Bachelor of Science - Information Technology standards. Most of the project work falls under the following types

a. Database oriented (e.g. payroll system, Loan management system etc.)
b. Application oriented (e.g. Mobile apps development, web based development)
c. R & D project (e.g. Image processing, speech processing, data mining, networking etc.)

C. Project Proposal (Synopsis)

The project proposal or the synopsis is the frame work for carrying out the project. It should be prepared in consultation with Guide. The necessary parts of a project proposal are given in the following form:

- Title of the Project.
- Introduction and Objectives of the Project.
- Project Category (RDBMS/ Application/ R & D).
- Tools, Platform, Hardware and Software Requirement specifications.
- Whether the project is done for any Industry/Client? The Name and Address of the Industry or Client is to be mentioned.
- Methodology
- Expected output
- Conclusion

D. Application Areas & Related Tools

A list of selected area for developing the project work is given below:

Applications:

Financial/ Manufacturing/ Multimedia/ Computer Graphics/ Instructional Design/ Database Management System/ Internet/ Intranet/ Computer Networking-

Communication Software/ E-Commerce/ TCP/IP Internals/ Routing protocols/ Implementation of Switches & Routers/ Image processing,/ Mobile apps development etc..

Related Tools:

- **Front End / GUI Tools:** PhP, Scripting languages etc.
- **RDBMS/Back End:** Oracle, MYSQL, No SQL, DB2 etc.
- **Languages:** C, C++, Java, VC++, C#, Mat lab, Python, Scilab etc.
- **Internet Technologies :** DHTML, Java script, VB Script, HTML, Java, Active X, SWING, JSP,ASP, PHP, XML, Java Beans, Java Servlets, CSS, VB.Net, AWT, J2EE.
- **Networking Technologies:** ATM, Frame Relay, TCP/IP, SNMP, GSM, VoIP, PPP, IP-PSTN, SONET/SDH
- **Wireless Technologies:** Bluetooth, 3G, ISDN, EDGE
- **Operating Systems:** Windows/ DOS / UNIX / Linux /Android.

Software Project Report Guideline

The Project report should prepared in well-structured preferably typed in Latex. Depending on the type of project the report should be as follows:

Acknowledgement
Content with page number
Declaration Certificate
Certificate from Guide

Chapter-1: Introduction

1.1 Brief idea about the project
1.2 Objective of the project
1.3 Scope of the project
1.4 Existing system
1.5 Proposed System
1.6 Platform used (Hardware & Software)
1.7 Project location

Chapter-2: Requirement Analysis

2.1 Introduction
2.2 Tools used for Requirement gathering
2.3 Problem in Existing System
2.4 Conclusion

Chapter-3: Logical Design

3.1 Introduction
3.2 DFD (0th, 1st, 2nd level)
3.3 ER diagram
3.4 Use case diagram
3.5 Activity diagram
3.6 Conclusion

Chapter-4: Physical Design

4.1 Introduction
4.2 Database Design (Give your normalized database here)
4.3 Module design
4.4 Input/output design
4.5 Conclusion

Chapter-5: Implementation
5.1 Introduction
5.2 Process description (if any)
5.3 Output & Report
5.4 Conclusion

Chapter-6: Testing
6.1 Introduction
6.2 Types of testing performed
6.3 Conclusion

References
Appendix (if any)