

School of Computer Science
Bachelor of Science – Information Technology
Syllabus for three/four years Honours Degree Programme
with Multiple Entry and Exit Options

Sr. No.	Subject Code	Subject Name	Paper Type	Credit	
				Theory	Practical
Semester-1					
1	BSCITRMA-101	Programming using C	Major (Core)	4	
2	BSCITRMA-102	Fundamental of Operating System	Major (Core)	4	
3	BSCITRMI-103	Computer Fundamental	Minor	4	
4	BSCITRMU-104	Introduction to Statistics	Multidisciplinary / Interdisciplinary	4	
5	BSCITRAE-105	Communication Skills-I	AEC	2	
6	BSCITRSE-106	Software Lab Based on BSCITRMA-101	SEC		2
7	BSCITRVA-107	Environmental Studies-I	VAC	2	
				20	2
Semester-2					
1	BSCITRMA-201	Database Management System	Major (Core)	4	
2	BSCITRMA-202	Data Structures	Major (Core)	4	
3	BSCITRMI-203	Object Oriented Programming using C++	Minor	4	
4	BSCITRMU-204	Financial Accounting and Management	Multidisciplinary / Interdisciplinary	4	
5	BSCITRAE-205	Communication Skills-II	AEC	2	
6	BSCITRSE-206	Software Lab Based on BSCITRMA-201, BSCITRMA-202 and BSCITRMI-203	SEC		2
7	BSCITRVA-207	Environmental Studies-II	VAC	2	
				20	2
Semester-3					
1	BSCITRMA-301	RDBMS Database Management System	Major (Core)	4	
2	BSCITRMA-302	Software Engineering	Major (Core)	4	
3	BSCITRMA-303	Computer Networks	Major (Core)	4	
4	BSCITRIN-304	Cyber Security	Multidisciplinary / Interdisciplinary	4	
5	BSCITRAE-305	Social Media and BLOG Writing-I	AEC	2	
6	BSCITRSE-306	Software Lab Based on BSCITRMA-301	SEC		2
7	BSCITRVA-307	Yoga Science and Life Philosophy-I	VAC	2	
				20	2

Semester-4					
1	BSCITRMA-401	Object Oriented Programming using Java	Major (Core)	4	
2	BSCITRMA-402	Client Server Architecture and Interface	Major (Core)	4	
3	BSCITRMA-403	Digital Electronics	Major (Core)	4	
4	BSCITRMI-404	Introduction to Web Designing	Minor	4	
5	BSCITRAE-405	Social Media and BLOG Writing-II	AEC	2	
6	BSCITRSE-406	Software Lab Based on BSCITRMA-401 and BSCITRMI-404	SEC		2
7	BSCITRVA-407	Yoga Science and Life Philosophy-II	VAC	2	
				20	2
Semester-5					
1	BSCITRMA-501	Introduction to Python Programming	Major (Core)	4	
2	BSCITRMA-502	Computer Oriented Numerical Method	Major (Core)	4	
3	BSCITRMA-503	Introduction to Algorithms	Major (Core)	4	
4	BSCITRMI-504	Advanced Java	Minor	4	
5	BSCITRMI-505	Mobile Operating Systems	Minor	4	
6	BSCITRSE-506	Practical based on BSCITRMA-501, BSCITRMI-504 and BSCITRMI-505	SEC		2
				20	2
Semester-6					
1	BSCITRMA-601	IOT and Its Application	Major (Core)	4	
2	BSCITRMA-602	Cloud Computing	Major (Core)	4	
3	BSCITRMA-603	Introduction to Block chain	Major (Core)	4	
4	BSCITRMI-604	Software Project Management	Minor (Elective)	4	
5	BSCITRMI-604	Data Warehousing and Data Mining	Minor (Elective)	4	
6	BSCITRAE-605	Modern Indian Language	AEC	2	
7	BSCITRSE-606	Project Cum Internship	SEC		4
				22	4
Semester-7					
1	BSCITRHMA-701	Web Development LAMP	Major (Core)	4	
2	BSCITRHMA-702	Open Source Technology	Major (Core)	4	
3	BSCITRHMA-703	Cyber Security Techniques	Major (Core)	4	
4	BSCITRHMI-704	SWAYAM-I	Minor	4	
5	BSCITROJT-705	System Development Project - I	OJT		6
				16	6
Semester-8					
1	BSCITRHMA-801	Big Data Analytics	Major (Core)	4	
2	BSCITRHMA-802	OOAD using UML	Major (Core)	4	
3	BSCITRHMA-803	Cloud Infrastructure and Services	Major (Core)	4	
4	BSCITRHMI-804	SWAYAM-II	Minor	4	
5	BSCITROJT-805	System Development Project - II	OJT		6
				16	6

Subject: BSCITRMA-101 Programming using C

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Information to C Language• Keyword• Variable and Constants• Data Type• Operators
Block-2	<ul style="list-style-type: none">• Output, Input• Control statement• Loop• Nested control• Nested Loop
Block-3	<ul style="list-style-type: none">• Array• String• Multidimensional Array• Functions
Block-4	<ul style="list-style-type: none">• Structure• Pointer• File Management

Subject: BSCITRMA-102 Fundamental of Operating System

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction to Operating System• Operating System Structure
Block-2	<ul style="list-style-type: none">• Processes• Threads• Process Scheduling• Process Synchronization and Deadlocks
Block-3	<ul style="list-style-type: none">• Memory Management• Page Replacement Algorithms
Block-4	<ul style="list-style-type: none">• File Systems Interface• File System Implementation• Mass Storage Structure• I/O Systems
Block-5	<ul style="list-style-type: none">• Protection• Security

Subject: BSCITRMI-103 Computer Fundamental

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Overview of computers, Operating Systems, and Applications.• Overview of Windows 10 Operating System, File System, and Snipping Tool.
Block-2	<ul style="list-style-type: none">• Overview of Computer Networks, Internet, Browsers, and Cloud Computing.• Overview of Google Gmail, Contacts, Calendar, Google Drive, and OneDrive.
Block-3	<ul style="list-style-type: none">• Overview of Computer Security and Key System Utilities (Defender, Disk Cleanup, Defrag, Task Manager and Backup).
Block-4	<ul style="list-style-type: none">• 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.

Subject: BSCITRAE-105 Communication Skills-I

Block	Detailed 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

Subject: BSCITRMA-201 Database Management System

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction to Database Systems• Database History• Data Modelling• Data Models
Block-2	<ul style="list-style-type: none">• Relational Data Model• Entity Relationship Model• Integrity Rules and Constraints.• Relational Design and Redundancy
Block-3	<ul style="list-style-type: none">• Functional Dependencies• Introduction to Data Normalization
Block-4	<ul style="list-style-type: none">• Introduction to SQL• SQL – Data Manipulation Language• SQL – Join Statements• Database Development Process

Subject: BSCITRMA-202 Data Structures

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction to Data Structure• Algorithms
Block-2	<ul style="list-style-type: none">• Linked Lists• Stack• Queue
Block-3	<ul style="list-style-type: none">• Searching• Sorting
Block-4	<ul style="list-style-type: none">• Trees• Binary Search Tree• B-Tree• Graph

Subject: BSCITRMI-203**Object Oriented Programming using C++**

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction to Object Oriented Programming• Elements of C++ Language• Operators and Manipulators• Decision and Control Structures
Block-2	<ul style="list-style-type: none">• Array, Pointer and Structure• Functions• Introduction to Classes and Objects
Block-3	<ul style="list-style-type: none">• Constructors and Destructors• Operator Overloading
Block-4	<ul style="list-style-type: none">• Inheritance• Virtual Functions and Polymorphism• File Handling

Subject: BSCITRMU-204**Financial Accounting and Management**

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Fundamentals of Accounting• Financial Statements
Block-2	<ul style="list-style-type: none">• Accounting Ratio• Cash Flow Statement
Block-3	<ul style="list-style-type: none">• Cost Concepts• Cost Sheet
Block-4	<ul style="list-style-type: none">• Budgetary Control• Marginal Costing• Capital• Working Capital

Subject: BSCITRAE-205 Communication Skills-II

Block	Detailed syllabus
Block-1	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-2	Understanding Specific Communication Needs: Corporate Communication, Persuasive Strategies in Business Communication, and 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.

Subject: BSCITRMA-301 RDBMS

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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.
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Subject: BSCITRMA-302 Software Engineering

Block	Detail syllabus
Block-1	<ul style="list-style-type: none"> • Definition of Software Engineering • Need for Software Engineering • Software Characteristics • Software Qualities
Block-2	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • System Development Methodologies • Analysis and Design Tools
Block-4	<ul style="list-style-type: none"> • Structured System Design • Software Testing

Subject: BSCITRMA-303 Computer Networks

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none"> • Introduction to Networking, Components of Networking, Different Computing Models of Network • Intranets and Internets Network Services, File Services, File Transfer Services, Printing Services, Application Services. • Fundamentals of communication theory
Block-2	<ul style="list-style-type: none"> • Introduction to Standards, Standard Organization and the OSI rules and the Communication Process. • The OSI reference Model • IEEE802 family standard.
Block-3	<ul style="list-style-type: none"> • Introduction to Transmission Media • Cable Media • Wireless Media • TCP/IP
Block-4	<ul style="list-style-type: none"> • Connectivity Devices • Network architectures • Topologies, Switching & Routing In Networks

Subject: BSCITRIN-304 Cyber Security

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Cyber Security Essentials• Attack Vectors, Threat, Risk and Vulnerability• Advance Persistent Threat and Cyber Kill Chain• Cyber Security Framework
Block-2	<ul style="list-style-type: none">• Firewall and Packet Filters• Introduction to Windows and Linux Firewall• Attacks on Wireless Networks
Block-3	<ul style="list-style-type: none">• Scanning For Web Vulnerabilities Tools and HTTP Utilities• Application Inspection Tools• Password Cracking and Brute-Force Tools• Web Attack
Block-4	<ul style="list-style-type: none">• Cyber Crimes• Internet crime and Act• Intellectual Property in the Cyber world

Subject: BSCITRMA-401 Object Oriented Programming using Java

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction to Java, the Java Language Specification, API, JDK and IDE, Elementary Programming, Selection and Loops,
Block-2	<ul style="list-style-type: none">• Mathematical Functions, Characters, and Strings, Methods and Arrays
Block-3	<ul style="list-style-type: none">• Objects and Classes, Inheritance, Polymorphism, Abstract Classes• and Interfaces, Exception Handling, Lists, Sets and Maps
Block-4	<ul style="list-style-type: none">• Event-Driven Programming, Binary I/O, Sorting, Searching and• Hashing Java Database Programming

Subject: BSCITRMA-402 Client Server Architecture and Interface

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• SQL• PL/SQL Procedural Extension,• PL/SQL data types & Control Structures
Block-4	<ul style="list-style-type: none">• Cursors, Stored Procedures & Functions• Database Triggers• Package Creation• Dynamic SQL• Collections & Objects

Subject: BSCITRMA-403 Digital Electronics

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Boolean Algebra• Logic Gates• Simplification of Boolean Functions
Block-2	<ul style="list-style-type: none">• Combinational Switching Circuits• Logic Families
Block-3	<ul style="list-style-type: none">• Flip-flops• Shift Registers• Counters
Block-4	<ul style="list-style-type: none">• Digital to Analog Converters• Analog to Digital Converters• Digital Memories

Subject: BSCITRMI-404 Introduction to Web Designing

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Fundamental of Internet, Intranet and Extranet• Internet Terminology• Web Server and Protocols• Recent Internet Technology Applications
Block-2	<ul style="list-style-type: none">• HTML Tags• Designing HTML Table• Designing HTML Forms• Designing HTML Frames
Block-3	<ul style="list-style-type: none">• Cascading Style Sheet• Attributes of Cascading Style Sheet• Effects of Cascading Style Sheet• Other Effects of Cascading Style Sheet
Block-4	<ul style="list-style-type: none">• Introduction to JavaScript• Functions and Dialog of JavaScript• Event , Method and Properties of JavaScript• Built In Function

Subject: BSCITRMA-501 Introduction to Python Programming

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Introduction• Variable, Expression and Statement• Conditional Execution• Functions
Block-2	<ul style="list-style-type: none">• Iteration• String• Files• Lists
Block-3	<ul style="list-style-type: none">• Dictionaries• Tupels• Regular Expressions• Networked Program
Block-4	<ul style="list-style-type: none">• Python and Web Service• Object-Oriented Programming• Using database and SQL• Visualizing Data

Subject: BSCITRMA-502 Computer Oriented Numerical Method

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Computer Arithmetic• Solving Non-Linear Equations
Block-2	<ul style="list-style-type: none">• Solving Simultaneous Linear Algebraic Equations• Interpolation
Block-3	<ul style="list-style-type: none">• Least Squares Approximation of Function• Approximation of Functions
Block-4	<ul style="list-style-type: none">• Differentiation• Integration• Numerical Solution of Differential Equations

Subject: BSCITRMA-503 Introduction to Algorithms

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none">• Overview of algorithms• Time and Space Complexity• Growth of Functions
Block-2	<ul style="list-style-type: none">• Divide and Conquer• Probabilistic Analysis• Randomized Algorithms
Block-3	<ul style="list-style-type: none">• Dynamic Programming• Greedy Algorithm• Amortized Analysis
Block-4	<ul style="list-style-type: none">• Elementary Graph Algorithms• Minimum Spanning Trees• Single-Source Shortest Paths• Maximum Flow

Subject: BSCITRMI-504 Advanced Java

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none"> • Network Basics and Socket overview, TCP/IP client sockets, URL, TCP/IP server sockets, Datagram, java.net package Socket, Server Socket, InetAddress, URL, URLConnection
Block-2	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Servlet Model: Overview of Servlet, Servlet Life Cycle, HTTP Methods Structure and Deployment descriptor ServletContext and ServletConfig interface, Attributes in Servlet, Request Dispatcher 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	<ul style="list-style-type: none"> • JSP Overview: The Problem with Servlets, Life Cycle of JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment

Subject: BSCITRMI-505 Mobile Operating Systems

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none"> • Generalize Operating System • Functionality Of Generalize Operating System • Operating System Structures • Mobile Computing
Block-2	<ul style="list-style-type: none"> • Mobile Devices • Function Of Mobile Operating System • Mobile Operating System • Generalized Mobile Operating System Architecture and Comparison
Block-3	<ul style="list-style-type: none"> • Basics of Android Operating System • Internal Mechanism of Android OS • ios Operating System
Block-4	<ul style="list-style-type: none"> • Windows Phone • Blackberry • Symbain

Subject: BSCITRMA-601 IOT and Its Application

Block	Detailed syllabus
Block-1	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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

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)

Bachelor of Science – Information Technology

Practical Subjects

Subject: BSCITRSE-106 Software Lab Based on BSCITRMA-101 (Programming using C)

List of C Practical:

1. Write a program to calculate the simple interest.
2. Write a program to find the area and perimeter of square and rectangle.
3. Write a program to find the area or circle.
4. Write a program to perform arithmetic operations.
5. Write a program to convert the temperature in Fahrenheit to Celsius.
6. Write a program to swap value of two variables.
7. Write a program to find maximum from two integer numbers.
8. Write a program to check whether the given number is positive, negative or zero.
9. Write a program to enter values of two variables from user and check whether they are equal or not.
10. Write a program to check whether the given number is even or odd.
11. Write a program to check given year is a leap year or not.
12. Write a program to find maximum from three numbers given by user.
13. Write a program to calculate gross salary and net salary of an employee. Gross salary = basic + DA + HRA and Net salary = Gross Salary – PF – Tax. Basic salary should be entered by the user and DA, HRA, PF and Tax will be calculated as 80%, 20%, 10%, 12% of basic.
14. Write a program to display grade (distinction, first, second, pass, fail) according to percentage of five subjects' marks entered by the user.
15. Write a program to perform bitwise operators.
16. Write a program that uses sizeof() operator.
17. Write a program to find the sum of first 10 natural numbers.
18. Write a program to find sum of first 100 odd and even numbers.
19. Write a program to find the sum of digits of a given number.
20. Write a program to generate Fibonacci series up to N numbers: 0 1 1 2 3 5 8 N
21. Write a program to find 1+3+5+7+....+N.
22. Write a program to check entered number is Armstrong or not.
23. Write a program to print prime numbers between 1 to 50.
24. Write a program to print following patterns up to N.

```

1          1 2 3 4          1
2 3        1 2 3          2 2
4 5 6      1 2            3 3 3
7 8 9 10   1              4 4 4 4
    
```

```

*          *          * * * *
* *        * *        * * *
* * *      * * *      * *
* * * *    * * * *    *
    
```

```

A          *          C
B B        * *        CP
C C C      * * *      CPR
D D D D    * * * *    CPRO
           * * *      CPR
           * *        CP
           *          C
    
```

25. Write a program to read and print elements of one-dimensional array.
26. Write a program to find the sum of all elements of an array.
27. Write a program to count even and odd elements in an array.
28. Write a program to delete an element at desired position from an array.
29. Write a program to find maximum value from an array.
30. Write a program to sort elements of an array.
31. Write a program to sort an array in descending order.
32. Write a program to search an element from one-dimensional array.
33. Write a program to search an element from two-dimensional array.
34. Write a program to read and print elements of two-dimensional array.
35. Write a program to find the addition of two matrices of 3 x 3.
36. Write a program to find the multiplication of two matrices of 3 x 3.
37. Write a program to print transpose of a matrix.
38. Write a user defined function which prints your name 10 times.
39. Write a program to swap value of two variables using function.
40. Write a program to count number of words in the string.
41. Write a program to count number of vowels from a given string.
42. Write a program to copy one string to another without using strcpy().
43. Write a program to append two strings without strcat().
44. Write a program to find length of the given string without including string.h.
45. Write a program to convert lowercase string to uppercase string without including string.h.
46. Write a program to create, open and close a file.
47. Write a program to read name and marks of n number of students and store them in a file.
48. Write a program to create a structure student that prints information of five students.
49. Write a program to add two distances in feet and inches using structure.
50. Write a program to find the size of the union.

Subject: BSCITRSE-206 Software Lab Based on BSCITRMA-201, BSCITRMA-202 and BSCITRMI-203 (DBMS, Data Structure, C++)

Practical List DBMS:

1. Database creation, Table creation.
 - Create a new database (Select an example of your own wish)
 - View all databases
 - Learn about data types of attributes and create a new table in the database with different data types
 - Use of alter command to add and drop attributes
 - Modify attribute name
 - Use of desc command to display information about a table
 - Rename a table
 - Create more tables for your database

2. Data insertion, update/modification/Delete and retrieval, Query implementation
 - Insert tuples in the table including null values in the tuple
 - Update values in the table
 - Delete tuples in the table
 - Query to view all tuples of the table
 - Run basic queries to view particular attributes of a table
 - Run basic queries to use basic comparison operators
 - Run basic queries to view find certain tuples of a table
 - Run queries using order by, limit operators

3. Enforcing integrity constraints (Domain, Key constraints (Primary/Foreign keys), NOT NULL, UNIQUE, DEFAULT, Check)
 - Create a table with appropriate primary key
 - Alter a table to add primary key
 - Drop a primary key
 - Add a foreign key while create a table
 - Alter table to add a foreign key
 - Drop a foreign key
 - Include constraints like null/not noll, unique, default, check
 - Drop a constraint

Practical List Data Structure:

1. Write a program to search an element in the array using linear search.
2. Write a program to search an element in the array using binary search.
3. Write a program to merge two sorted array into one.
4. Write a program to swap values of variables using call by value and call by reference.
5. Write a program to implement bubble sort.
6. Write a program to implement selection sort.
7. Write a program to implement insertion sort.
8. Write a program to implement stack using array.
9. Write a program to implement queue using array.
10. Write a program to implement singly linked list with all operations.

Practical List C++:

1. Write a program to declare Structure. Initialize and display contents of member variables.
2. Write a program to create a class called EMPLOYEE that contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print data members.
3. Write a program to illustrate the concepts of console I/O operations.
4. Write a program to use scope resolution operator.
5. Write a program to implement multilevel inheritance.
6. Write a program to copy data of an object to another object using copy constructor.
7. Write a program to illustrate the use of virtual functions in class.
8. Write a program to demonstrate inline function.
9. Write a program to demonstrate function overloading.
10. Write a program to demonstrate pure virtual function.

List of Practical:

Create a Supplier table and perform following queries:

1. Write sql query to display Supplier numbers and Supplier names whose name starts with 'R'
2. Write sql query to display the name of suppliers who supply Processors and whose city is Delhi.
3. Write sql query to display the names of suppliers who supply the same items as supplied by Ramesh.
4. Write sql query to increase the price of Keyboard by 200.
5. Write sql query to display supplier numbers, Supplier names and itemprice for suppliers in delhi in the ascending order of itemprice.
6. Write sql query to add a new column called CONTACTNO.
7. Write sql query to delete the record whose itemprice is the lowest of all the items supplied.
8. Create a view on the table which displays only supplier numbers and supplier names.
9. Write sql query to display the records in the descending order of itemprice for each itemsupplied.
10. Write sql query to display the records of suppliers who supply items other than Processor or Keyboard.

Create a Table for Library Information and perform following queries:

1. Write sql query to display the list of authors from TMH publications.
2. Write sql query to display the total cost of books purchased Publisher wise.
3. Write sql query to count the total number of books under Cengage publications.
4. Write sql query to rename the column Publisher as Publications.
5. Write a sql query to display the books in the ascending order of DatePurchased.
6. Write sql query to create an index on the fields BookName and Author.
7. Write sql query to display the books whose price is between 500 and 700
8. Write sql query to increase the price of all the books by 200 for publishers other than TMH or Cengage.
9. Write sql query to display the book details where author name contains the name Sharma.
10. Create a view to display the fields BookId and BookName where the Publisher is Himalaya.

**Subject: BSCITRSE-406 Software Lab Based on BSCITRMA-401 and BSCITRMI-404
(Core Java, HTML)**

List of Core Java Practical:

1. Write a program that takes a number as input and prints its multiplication table upto 10.
2. Write a program to display the following pattern.

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*
3. Write a program to print the area and perimeter of a circle.
4. Write a class that demonstrates the use of constructor and destructor.
5. Write a program to demonstrate the implementation of abstract class.
6. Write a program to implement single level inheritance.
7. Write a program to implement method overriding.
8. Write a program to implement multiple inheritance.
9. Write a program to add two matrices and print the resultant matrix.
10. Write a program to implement thread life cycle.

List of HTML & Java Script Practical:

1. Write a code for html webpage which displays your name, college name, and semester.
2. Write a code for html webpage which redirects to Google page.
3. Write a code for html web page which displays your name in left, college name in right, and semester in center, your photo at bottom, your branch in red background color and text size - 50px.
4. Write a code for html webpage which displays table using <tr> and <td> tag.
5. Make a registration form in html web page which takes all the details of person.
6. Write a code for html webpage which displays a list.
7. Write a code for html web page which changes HTML Content. (using Javascript)
8. Write a code for html web page which changes HTML Attribute Values. (using Javascript)
9. Write a code for html web page which changes HTML Styles (CSS). (using Javascript)
10. Write a code for html web page which Hide and Show HTML Elements. (using Javascript)

Subject: BSCITRSE-506 Practical Based on BSCITRMA-501, BSCITRMI-504 and BSCITRMI-505 (Python, Advanced Java, Mobile OS)

List of Python Practical:

1. Write a program to swap two numbers without taking a temporary variable.
2. Create a sequence of numbers using range datatype to display 1 to 30, with an increment of 2.
3. Write a program to find out and display the common and the non-common elements in the list using membership operators.
4. Write a program to find the sum of even numbers using command line arguments.
5. Write a program to search an element in the list using for loop.
6. Write a program to create one array from another array.
7. Write a program to understand various methods of array class mentioned: append, insert, remove, pop, index, tolist and count.
8. Write a python program that removes any repeated items from a list so that each item appears at most once.
9. Write a lambda/Anonymous function to find bigger number in two given numbers.
10. Create a program name "employee.py" and implement the functions DA, HRA, PF, and ITAX. Create another program that uses the function of employee module and calculates gross and net salaries of an employee.
11. Write a program to combine two List, perform repetition of lists and create cloning of lists.
12. Write a program to create nested list and display its elements.
13. Write a program to accept elements in the form of a tuple and display its minimum, maximum, sum and average.
14. Write a program to create a dictionary from the user and display the elements.
15. Write a program to convert the elements of two lists into key-value pairs of a dictionary.

List of Advanced Java Practical:

1. Write a Servlet to display "Hello World" on browser.
2. Write a Servlet to display all the headers available from request.
3. Write a Servlet which displays a message and also displays how many times the message has been displayed (how many times the page has been visited).
4. Assume that the information regarding the marks for all the subjects of a student in the last exam are available in a database, Develop a Servlet which takes the enrollment number of a student as a request parameter and displays the marksheet for the student.
5. Write a simple JSP page to display a simple message.
6. Write a JSP page, which uses the include directive to show its header and footer.
7. Develop an application to demonstrate how the client (browser) can remember the last time it visited a page and displays the duration of time since its last visit. (Hint: use Cookie)
8. Implement TCP Server for transferring files using Socket and ServerSocket.

9. Implement cookies to store firstname and lastname using Java server pages.
10. Implement the shopping cart for users for the online shopping. Apply the concept of session.
11. Implement student registration form with enrollment number, first name, last name, semester, contact number. Store the details in database. Also implement search, delete and modify facility for student records.
12. Write a Servlet program to print system date and time.
13. Design a web page that takes the Username from user and if it is a valid username prints "Welcome Username". Use JSF to implement.
14. Write Hibernate application to store customer records and retrieve the customer record including name, contact number, address.
15. Write an application to keep record and retrieve record of student. The record includes student id, enrollment number, semester, SPI. Use MVC architecture.

List of Mobile OS Practical:

1. Create "hello world" application to display "hello world" in the middle of the screen in the emulator as well as android phone.
2. Create an android app to display various android lifecycle phases.
3. Create an android app with first activity having edittext and send button. On click of send button, use explicit intent to send the text within edittext to a second activity and displayed within textview.
4. Create a calculator app that performs addition, subtraction, division and multiplication operation on numbers.
5. Create a spinner application with strings taken from resource directory res/values/strings.xml and on changing the spinner value, image will change. Image is saved in the drawable directory.
6. Create an app that uses radiobutton group which calculates discount on shopping bill amount. Use edittext to enter bill amount and select one of three radio buttons to determine a discount for 10, 15, or 20 percent. The discount is calculated upon selection of one of the buttons and displayed in a textview control.
7. Create an app that uses radiobutton group of all courses in your college. On selecting one of the buttons, the Instructor of that course should be displayed in a textview control at the bottom of the screen.
8. Create an application that uses checkbox for construction of a shopping list so the user can check off items as they are picked up. The checked items should be displayed in a textview control.
9. Create a login application to verify username and password. Create a registration page to register a user. On successful login, "welcome user" should appear as a pop-up message.
10. Create a login application to verify username and password. On successful login, redirect to another activity that has a textview to display "welcome user" with logout button. On

click of logout button, a dialog should appear with ok and cancel buttons. On click of OK button, go back to the login activity and on click of cancel button, stay on the same activity.

11. Create a menu with 5 options. The selected option should appear in the textbox.
12. Use linear layout to create a simple application that will take the contents of a predefined textview and use a button to cause the application to take that text, convert it to uppercase, and display it in an edittext field.
13. Create an application that uses tablelayout with textview, edittext and buttons. Also, create ur own styles.xml file within res/values directory, to style text of textview control.
14. Create an application to perform the operations of create, insert, delete, view and update, using sqlite database.
15. Create an app to display 3 button controls vertically aligned. On selecting a button, the color of the screen will change.