Program Outcome of B.Sc.(I.T.)
(Bachelor of Science- Information Technology)

BSc. (IT) is Bachelor of Science in Information Technology. Apply your understanding of math, science, and computing to the fundamentals of information technology. Determine, develop, examine, implement, and understand the outcomes of complicated computer systems.

Create, construct, and test a computer-based system or process element to satisfy the required requirements while taking into account practical constraints including those related to the economy, the environment, society, politics, ethics, human health and safety, and sustainability. Utilizing research-based knowledge and techniques, review the literature and conduct research to design novel experiments, analyse data, and draw reliable findings. Choose and employ the most recent methods, abilities, and tools required for computing work, and successfully incorporate IT-based solutions into the user environment. Utilize contextual knowledge when evaluating professional, legal, health, social, and cultural issues. In a multidisciplinary team, perform well as a leader or team member to achieve a common goal. Utilize written, oral, and graphical communication to effectively interact with a variety of audiences.

As a team member or team leader, use your understanding of engineering and management principles to manage projects successfully in a variety of settings. Participate in independent, lifelong learning to advance your career.

Course Outcomes

Semester I

Programming Principles with C

Learning Objectives:

1. To develop the logical ability of the student.
2. Basic concepts to be cleared using suitable examples.
3. Different approach towards the problem.
4. To handle the errors and find suitable solution.
5. Debugging the code.

Learning Outcomes:
1. Learn the basic principles of programming.
2. Develop of logic using algorithm and flowchart.
3. Acquire the information about data types.
4. Understanding of input and output functions.
5. Enhance advanced concepts using program.

Digital Logic and Applications

Learning Objectives:

1. To introduce the basics of logic in digital electronics as an entry level course.
2. To interpret and assess number systems and the conversions of number systems
3. To analyse the boolean expressions and reduce the expression to the minimum.
4. To design simple logic circuits using tools such as Boolean Algebra and Karnaugh Mapping.
5. To understand the state of a memory cell and its types using flip-flops.
6. To create simple digital systems using counters, registers etc.

Learning Outcomes:

1. Apply number conversion techniques in real digital systems
2. Solve boolean algebra expressions
3. Derive and design logic circuits by applying minimization in SOP and POS forms
4. Design and develop Combinational and Sequential circuits
5. Understand and develop digital applications.

Fundamentals of Database Management Systems

Learning Objectives:

1. The objective of the course is to present an introduction to fundamentals of database management systems.
2. To emphasize on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Learning Outcomes:

1. Define and describe the fundamental elements of relational database management system.
2. To relate the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
3. Design ER-models to represent simple database application scenarios.
4. Transform the ER-model to relational tables, populate relational database and formulate SQL queries on data.
5. Improve the database design by normalization.
6. Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.

Computational Logic and Discrete Structures

Learning Objectives:

1. Course will provide students with an overview of discrete mathematics.
2. Students will learn about topics such as logic and proofs, sets and functions, recursion, graph theory, tress and other important discrete math concepts.

Learning Outcomes:

1. Use logical notation
2. Perform logical proofs
3. Apply recursive functions and solve recurrence relations
4. Use graphs and trees
5. Apply basic and advanced principles of counting
6. Define sets and Relations
7. Calculate discrete probabilities.

Programming Principles with C

Learning Objectives:

1. To recognize the importance of various types of communication in technical set up.
2. To understand the dynamics in different forms of formal communication.
3. To learn about active listening and the art of giving presentations and interviews.
4. To learn the art of business writing and ethics in business communication across functional areas.
5. To evaluate, analyze and interpret technical data.

Learning Outcomes:

1. Analyze, synthesize and utilize the process and strategies from delivery to solving communication problem.
2. Learn the communication methodologies at workplace and learning about importance of team collaboration.
3. Learn about different technical communication such as presentations and interviews.
4. Understand and apply the art of written communication in writing reports, proposals.
5. Ground rules of ethical communication and MIS.
6. Understand the functions of graphs, maps, charts.

Semester II
Programming Principles with C++

Learning Objectives:

1. Be able to explain the difference between object oriented programming and procedural programming.
2. Be able to program using more advanced C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling, etc.
3. Be able to build C++ classes using appropriate encapsulation and design principles
4. Be able to apply object oriented or non-object oriented techniques to solve bigger computing problems

Learning Outcomes:

1. Understand the concept of OOPs, feature of C++ language.
2. Understand and apply various types of Datatypes, Operators, Conversions while designing the program.
3. Understand and apply the concepts of Classes &Objects, friend function, constructors & destructors in program design.
4. Design & implement various forms of inheritance, String class, calling base class constructors.
5. Apply & Analyze operator overloading, runtime polymorphism, Generic Programming.
6. Analyze and explore various Stream classes, I/O operations and exception handling.

Fundamentals of Micro Processor and Microcontrollers

Learning Objectives:

1. To understand the basic concept of Micro Computer Systems
2. To develop background knowledge in 8085 Microprocessor
3. To write Assembly language Programs of 8085
4. To understand the peripheral devices and interfacing to 8051 Microcontroller and design aspects of Micro Controller

Learning Outcomes:

1. Understand the basic concepts of Micro Computer Systems
2. Understand the architecture and hardware aspects of 8085
3. Write assembly language programs in 8085
4. Design elementary aspects of Micro Controller based systems
5. Interfacing peripherals using Micro Controller.

Web Applications Development

Learning Objectives:

1. Understand basic concepts of Internet and World Wide Web.
2. Comprehend different HTML elements that can be used to develop static web pages.
3. Become familiar with concept of stylesheets and various CSS effects.
4. Peruse JavaScript as a tool to add dynamism to static HTML pages.
5. Explore how server-side script works on the web.
6. Learn how PHP can be connected to a database to store and retrieve data.

Learning Outcomes:

1. Analyze working of Internet.
2. Gain an insight into designing web pages.
3. Use different ways of styling web pages using CSS.
4. Implement basic and complex functionalities of JavaScript in a web page.
5. Employ PHP Scripts to execute dynamic tasks in a web page.
6. Perform various database tasks using PHP.

Numerical Methods

Learning Objectives:

➢ Course will enhance the problem solving skills of students using extremely powerful numerical methods.

Learning Outcomes:

1. Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations.
2. Understand the difference operators and the use of interpolation.
3. Understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.

Green IT

Learning Objectives:

1. To understand the concept of Green Technology.
2. To learn Green IT regulating Green IT and different standards.
3. To understand the concept of minimizing power utilization in technology.
4. To know about Green PCs, Green notebooks and servers and Green data centers.

5. To know how the way of work is changing and understand implementation of Paperless work.
6. To know the concept of Recycling.
7. To understand Metrics for Green IT.

Learning Outcomes:

1. Understand the concept of Green IT and problems related to it.
2. Know different standards for Green IT.
3. Understand the how power usage can be minimized in Technology.
4. Learn about how the way of work is changing.
5. Understand the concept of recycling.
6. Know how information system can stay Green Information system.

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Semester III
Python Programming

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Learning Objective

- To be familiar about the basic constructs of programming such as functions, Strings, Tuples, Lists, Sets and Dictionaries etc.
- To understand how to read/write to files, handle exceptions and multithreading using python.
- To build and package Python modules for reusability.
- To understand the concept of pattern matching.
- To understand the advanced concepts of GUI controls and designing GUI applications along with database connectivity to move the data to/from the application.
- To be familiar with concepts of network programming, Sending email using
- smtp and web programming

Learning Outcome

- Interpret Object oriented programming in Python.
- Understand and summarize different File handling operations
- Explain how to design GUI Applications in Python and evaluate different database operations
- Design and develop Client Server network applications using Python

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Applied Data Structures and Algorithms

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Learning Objective

- To impart the basic concepts of data structures and algorithms
- To understand concepts about searching and sorting techniques
- To Understand basic concepts about stacks, queues, trees and graphs

- To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures
- To improve the logical ability

Learning Outcome

- Describe how arrays, records, linked lists, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked list, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees.

Computer Networks

Learning Objective

- This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks.
- Build an understanding of the fundamental concepts of computer networking.
- Understand and building the skills of subnetting and routing mechanisms.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking

Learning Outcome

- This course will prepare students in Basic networking concepts.
- Understand and explain Data Communications System and its components.
- Understand different types of networks, various topologies and application of networks.
- Understand types of addresses, data communication.
- Have an understanding of the issues surrounding Mobile and Wireless Networks.
- Understand the concept of networking models, protocols, functionality of each layer.
- Learn basic networking hardware and tools.
- Identify the different types of network topologies and protocols. .
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer

Databases and Transactions

Learning Objective

- Manipulation of data.
- Learning the development and structuring of data.
- Managing the transactions of the automated information and management Systems

Learning Outcome

- Handling large sets of data.
- Foundation for learning various types of databases.

- Detailed understanding of transaction management.

Core Java with JSP

Learning Objective

- To become familiar with the features of Java Language
- To discover how to write Java code according to Object-Oriented Programming principles.
- To become comfortable with concepts such as Classes, Objects, Inheritance, Polymorphism and Interfaces
- To learn Java APIs for Collections, I/O Streams
- To design GUI applications and Applets using AWT and Swing.
- To develop Multithreaded and Networking application Introduce Java EE Concepts with JSP

Learning Outcome

The course is designed to provide programming fundamentals using JAVA along with JSP Enterprise Programming Concepts

Semester IV

Core Java

Learning Objective

- learning programming skills and logic
- learning object oriented approach

Learning Outcome

- development of skill in higher level languages

Embedded Systems

Learning Objective

- This course is structured to combine lectures, for the students to gain an in-depth understanding of fundamental concepts on embedded systems.
- To provide in-depth knowledge about embedded processor, its hardware.
- To explain programming concepts and embedded programming in C
- To explain real time operating systems.

Learning Outcome

Course the students should be able to:

- Understand the hardware and software components as well as their development cycles.
- Understand the deployment of embedded processors and supporting devices.
- 8051 programming in C designing of embedded system with 8051

Computer Oriented Statistical Techniques

Learning Objective

- Statisticians help to design data collection plans, analyze data appropriately and interpret and draw conclusions from those analyses. The central objective of the undergraduate major in Statistics is to equip students with consequently requisite quantitative skills that they can employ and build on in flexible ways.

Learning Outcome

- The fundamentals of probability theory,
- Statistical reasoning and inferential methods
- Statistical computing,
- Statistical modeling and its limitations, and have skill in
- Description, interpretation and exploratory analysis of data by graphical and other means;

Software Engineering

Learning Objective

- Understanding the development procedure and process
- Learning engineering techniques
- Introduction to models and estimation techniques.

Learning Outcome

- Engineering application to provide systematic approach to the development.
- Construction of business logic and management.

Computer Graphics and Animation

Learning Objective

- Identify and explain the core concepts of computer graphics.
- Apply graphics programming techniques to design, and create computer graphics scenes.
- Create programs to solve graphics programming issues, including 3D transformation, colour modeling, textures, and ray tracing.

Learning Outcome

- Students will demonstrate their ability to use computer graphics techniques, models, and algorithms to solve graphics problems