2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Department are stated and displayed in website of the institution.

1. *Name of Department:* **Department of Information Technology**

2. *Title of Programme:* **BSc IT**

3. *Programme Outcomes:*

    a) To think analytically, creatively and critically in developing robust, extensible and

    b) Highly maintainable technological solutions to simple and complex problems.

    c) To apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.

    d) To be capable of managing complex IT projects with consideration of the human, financial and environmental factors.

    e) To work effectively as a part of a team to achieve a common stated goal.

    f) To adhere to the highest standards of ethics, including relevant industry and organizational codes of conduct.

    g) To communicate effectively with a range of audiences both technical and non-technical.

    h) To develop an aptitude to engage in continuing professional development.

4. *Programme Specific Outcomes:*

- Apply the knowledge of mathematics, science and computing in the core information technologies.
- Identify, design, and analyze complex computer systems and implement and interpret the results from those systems.
- Design, implement and evaluate a computer-based system, or process component, to meet the desired needs within the realistic constraints such as economic, environmental, social, political, ethical, health and safety, maneuverability, and sustainability.
- Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions.
- Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectively.
- Apply contextual knowledge to assess professional, legal, health, social and cultural issues during profession practice.

- Analyze the local and global impact of computing on individuals, organizations, and society.
- Apply ethical principles and responsibilities during professional practice.
- Function effectively as a team member or a leader to accomplish a common goal in a multidisciplinary team.
- Communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.
- Apply the knowledge of engineering and management principles to manage projects effectively in diverse environments as a member or a leader in the team.
- Engage in independent and life-long learning for continued professional development.

5. Course Outcomes:

Title of the course	Course credit	Course outcome
Imperative Programming	2	1. To introduce different programming paradigms and develop logic for writing high level language programs. Students would be able to understand the basic concept of programming constructs and Procedure Oriented Programming. 2. To familiarize the students with the basic understanding of flowcharts and algorithms Students would develop basic understanding of flowcharts, the concept of algorithm and algorithmic thinking.
Digital Electronics	2	1. To make students learn different types of number systems. Students would understand and examine the structure of various number systems and its application in digital design. 2. To make students acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. Students would develop the basic knowledge of digital logic and application of knowledge to understand digital electronics circuits. 3. To prepare students to perform the analysis and design of various digital electronic circuits. Students would develop an ability to analyze and design various digital electronic circuits
Operating Systems	2	To make students learn the fundamentals of Operating Systems. Students would develop an ability to analyze the structure of OS and basic architectural components involved in OS design. 2. To make students learn the mechanisms of OS to handle processes and threads and

		their communication. Students would develop an ability to compare the various algorithms used for management of memory, CPU scheduling, file handling and I/O operations. 3. To make students gain knowledge on distributed operating system concepts that includes architecture, mutual exclusion algorithms, deadlock detection algorithms and agreement protocols. Students would understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
Discrete Mathematics	2	To make students learn the basic principles of set, basic set equalities, the basic concepts of relations and functions and the basic concepts of graphs and trees. Students would understand the basic principles of set, basic set equalities, the basic concepts of relations and functions. 2. To make students learn writing an argument using logical notation and determine if the argument is valid or invalid. Students would be able to write an argument using logical notation and determine if the argument is valid or invalid. 3. To make students learn the basic concepts of Students would be able to understand basic data structures in mathematics. concepts of graphs and trees
Communication Skills	2	Acquaint students with the theoretical landscape of communication as it applies to individual employees in business Students would understand process, nature and various domains of communication application. 2. To familiarize students with application of this theory for effective written, oral and interpersonal communication. Students would familiarize with basic conventions and principles of effective written, oral and interpersonal communication
Object Oriented Programming	2	To enable students to understand objectoriented programming. Students would be able to understand the basic concept of Object Oriented Programming. 2. To explain the difference between objectoriented programming and procedural programming. Students would be able to understand the basics of computer programming. The problem solving approaches in different programming languages, variables, operators. 3. To teach the various types of statements and looping constructs.

		Students would be able to understand the purpose of control statements: selection and looping statements.
Microprocessor Architecture	2	To enable the students to learn the concept of assembly languages and acquire knowledge about 8085 microprocessor. Students will learn to apply the fundamentals of assembly language and acquire basic knowledge of microprocessors. 2. To educate the students about 8085 architecture and instruction set. Students would be able to understand the history and architecture of microprocessors and 8085 instruction set.
Web Programming	2	To make the students learn web history, website organization, HTML, graphics use, page and site design, with a brief look at CSS, and JavaScript. Students would be able to learn standard compliant CSS and JavaScript to present HTML5 pages. 2. To enable students learn the basic and advanced PHP programming with Database connectivity using MYSQL. Students would be able to understand the basic and advanced PHP programming with Database connectivity using MYSQL.
Numerical and Statistical Methods	2	To make the students analyze the errors obtained in the numerical solution of problems. Students will be able to analyze the errors obtained in the numerical solution of problems. 2. To help students to learn the use of appropriate numerical method to determine approximate solution of algebraic and transcendental equations, system of linear equations, ordinary differential equation and integration. Students will be able to use appropriate numerical method to determine approximate solution of, algebraic and transcendental equations, system of linear equation, ordinary differential equation and integration. 3. To make students learn modelling and solving linear programming problems. Students will be able to model and solve linear programming problems.
Green Computing	2	Upon completion of the course, students should be able to: - give an account of the concept green IT, - give an account of environmental perspectives on IT use, - give an account of standards and certifications related to sustainable IT products, - describe green IT in relation to technology
Python Programming	2	To explain a basic introduction to object-oriented and procedural programming using Python. Students will be

		able to understand why Python is a useful scripting language for developers. 2. To acquire knowledge and programming skills in python to solve problems in different domains Students will learn how to design and program Python applications.
Data Structures	2	To enable students to understand the representation and use of primitive data types, built in data structures and allocation used in memory. Students will be able to understand the representation and use of primitive data types, built in data structures and allocation used in memory. 2. To enable students to understand the concept of stack, queue, link list, tree, graph, memory allocation, garbage collection and applications of Data Structures. Students will be able to understand the concept of stack, queue, link list, tree, graph, memory allocation, garbage collection and applications of Data Structures
Computer Networks	2	To help students acquire basic knowledge about data communications and computer networking. Students will be able to acquire basic knowledge of the taxonomy and terminology related to computer networking and enumerates the layers of OSI model and TCP/IP model. 2. To assist student to learn about the different models and devices related to networks Students will be able to acquire basic knowledge about routing and classification the routing protocols and analysis of assignment of the IP addresses for the given network.
Database Management Systems	2	To help students to learn database management system with an emphasis on how to organize, maintain and retrieve information from a DBMS. Students will be able to able to differentiate Database management system and file processing system. 2. To help students to learn about ER Diagram and their relationships. Students will be able to make an ER Diagram using online softwares 3. To help students learn the concepts of integrity and security. Students will be able to able to understand the concepts of integrity, security and normalization approach.
Applied Mathematics	2	Students will be taught the basic concepts of matrices and complex numbers. Student will be able to understand basic concepts of matrices and complex numbers. 2.

		Students will be taught to solve linear and higher order differential equations. Student will be able to solve linear and higher order differential equations. 3. Students will be taught the concepts of Laplace and inverse Laplace transform and solve differential equations by using Laplace and inverse Laplace transform. Student will be able to understand concepts of Laplace and inverse Laplace transform and solve differential equations by using Laplace and inverse Laplace transform. 4. Students will be taught to solve multiple integral and find area and volume of regions by using multiple integration. Student will be able to solve multiple integral and find area and volume of regions by using multiple integration
Introduction to Embedded Systems	2	To acquire knowledge about the basic working of a microcontroller system and its programming using high level languages. Student will be able to understand the difference between the general computing system and the embedded system and also recognize its classification. 2. To provide experiential learning to integrate hardware and software for microcontroller application systems. Student will learn to integrate hardware and software for microcontroller application systems.
Computer Oriented Statistical Techniques	2	Students will be taught to apply t-test and Chi-Square test for independence and Goodness of fit. Student will be able to analyze ungrouped and grouped data using measures of location and dispersion. 2. Students will be taught to perform test of hypothesis as well as calculate Student will be able to perform test of hypothesis as well as calculate confidence interval for a population parameter for single sample and double sample. confidence interval for a population parameter for single sample and double sample. 3. Students will be taught to analyze ungrouped and grouped data using measures of location and dispersion. Student will be able to apply Student's t-test and Chi-Square test for independence and Goodness of fit. 4. Students will be taught to compute and interpret results of bivariate and multivariate regression and correlation analysis for forecasting. Student will be able to compute and interpret results of bivariate and multivariate

		regression and correlation analysis for forecasting.
Software Engineering	2	Students will be provided with the knowledge of basic Software engineering methods and practices, and their appropriate application. Student will be able to understand the different process models and project management concepts. 2. Students will be taught software engineering layered technology and Process framework. Student will be able to develop skills for cost estimation for software development and understand the software risks 3. Students will be given a general understanding of software process models such as the waterfall and evolutionary models. Student will be able to enhance teamwork ability in project scheduling and apply the concepts of software quality assurance. 4. To make the students understand software requirements and the SRS documents. Student will be able to make a SRS for a real time project.
Computer Graphics and Animation	2	To make students learn the use of components of graphics system. Student will be able to able to learn basic concepts used in computer graphics. 2. To make students learn to convert the basic geometrical primitives and transform the shapes to fit them as per the picture definition. Student will be able to to implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping. 3. To make students comprehend and analyze the fundamentals of animation Student will be able to describe the importance of viewing and projections in 2D and 3D and also to define the fundamentals of animation, virtual reality and its related technologies.
		To provide knowledge about basic Java language syntax and semantics to write Java programs. Student will be able to understand how to design, implement, test, debug, and document programs using basic Java language syntax and semantics. 2. To assist students to understand the fundamentals of object-oriented programming in Java to design GUI applications Student will be able to implement object oriented programming concepts effectively. 3. To teach how to design a graphical user interface (GUI) using applets and AWT in Java. Student will be able to demonstrate how to achieve

		reusability using inheritance, interfaces and packages and describes faster application development can be achieved
Core java	2	To provide knowledge about basic Java language syntax and semantics to write Java programs. Student will be able to understand how to design, implement, test, debug, and document programs using basic Java language syntax and semantics. 2. To assist students to understand the fundamentals of object-oriented programming in Java to design GUI applications Student will be able to implement object oriented programming concepts effectively. 3. To teach how to design a graphical user interface (GUI) using applets and AWT in Java. Student will be able to demonstrate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved
Software Project Management	2	Students will be able to learn different techniques of choosing Methodologies & Technologies , process models to manage and complete software project successfully. They will be able to identify issues that could lead to project success or failure. Students will also get acquainted with concept of resource management , project manager responsibilities , team building & risk Management. Tools & techniques for project estimating & scheduling will be presented through this course .
Internet of Things	2	Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT devices. Networks . Able to understand building blocks of internet of Things and characteristics.
Advanced Web Programming	2	A course that takes the principles learned in .net and applies them to the environment of the web. This course covers topics ranging from programming a basic, web-based shopping cart to integrating the application to a back-end database. Topics covered in this course will include securing a web application, validating user input, managing web session state, using master template pages and themes for site consistency, web application data source connections and more.
Artificial Intelligence	2	AI is an introductory course in Artificial Intelligence. The goal is to acquire knowledge on intelligent systems and agents, formalization of knowledge, reasoning with and without uncertainty, machine learning and applications at a basic level.

Enterprise Java	2	Enterprise Java is **the use of Java for application development in enterprise-scale software**, and merges a collection of APIs and application servers that implement those APIs. Enterprise Java also includes related technologies, such as the Spring Framework.
Project Dissertation	2	It provides complete guidance & support of developing software project. It actually helps us to create document before implementation of software project.
Software Quality Assurance	2	Establish organizational procedures and standards for quality. Select procedures and standards for a particular project. Ensure quality procedures and standards are followed by the software development team. Quality Management should be independent from project management.
Security in Computing	2	An ability to apply knowledge of computing and mathematics appropriate to the discipline. An ability to identify, formulate, and develop solutions to computational challenges. An ability to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.
Cyber Laws	2	**When Internet was developed, the founding fathers of Internet hardly had any inclination that Internet could transform itself into an all pervading revolution which could be misused for criminal activities and which required regulation. Today, there are many disturbing things happening in cyberspace. Due to the anonymous nature of the Internet, it is possible to engage into a variety of criminal activities with impunity and people with intelligence, have been grossly misusing this aspect of the Internet to perpetuate criminal activities in cyberspace. Hence the need for Cyber laws. It is important because it touches almost all aspects of transactions and activities on and concerning the Internet, the World Wide Web and Cyberspace.**
Project Implementation		Project implementation (or project execution) is the phase where visions and plans become reality. This is the logical conclusion, after evaluating, deciding, visioning, planning, applying for funds and finding the financial resources of a project. Technical implementation is one part of executing a project.
Geographic Information Systems	2	GIS provides the capability to relate previously unrelated information, through the use of location as the "key index variable". Locations and extents that are found in the Earth's spacetime, are able to be recorded through the date and time of occurrence, along with x, y, and z coordinates; representing, longitude (x), latitude (y), and elevation (z). All Earth-based, spatial – temporal, location and extent references,

		should be relatable to one another, and ultimately, to a "real" physical location or extent. This key characteristic of GIS, has begun to open new avenues of scientific inquiry and studies.
Business Intelligence	2	Business intelligence (BI) comprises the strategies and technologies used by enterprises for the data analysis and management of business information. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, dashboard development, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics, and prescriptive analytics.BI technologies can handle large amounts of structured and sometimes unstructured data to help identify, develop, and otherwise create new strategic business opportunities. They aim to allow for the easy interpretation of these big data.