Programme Outcomes and Course Outcomes

Bachelor of Science in Information Technology (B.Sc.IT)

UTTAR BHARATIYA SANGH'S

MAHENDRA PRATAP SHARADA PRASAD SINGH COLLEGE OF ARTS, COMMERCE AND SCIENCE

(Affiliated to University of Mumbai) (COLLEGE CODE - 729)

PROGRAMME NAME: B.Sc. Information Technology

B.Sc. Information Technology – PROGRAMME OUTCOMES

PO 1. Attain a solid understanding of information technology concepts, systems, and tools for effective problem-solving.
PO 2. Develop skills in software development, emphasizing application design, coding, and testing methodologies.
PO 3. Gain expertise in database management, data analytics, and information security.
PO 4. Cultivate effective communication and teamwork skills for collaborative IT project development.
PO 5. Apply theoretical knowledge to real-world scenarios, fostering adaptability and innovation in information technology solutions.

B.Sc. Information Technology– PROGRAMME SPECIFIC OUTCOMES

PSO 1: Develop and analyse quality computer applications by applying knowledge of software engineering, algorithms, programming, databases, mathematical models Artificial Intelligence and networking

PSO 2: An ability to use current techniques, skills and tools for programming practically

PSO 3: Capability of the students to apply design and development principles in the construction of software system.

PSO 4: Ability to provide socially acceptable technical solutions in the domains of Information Security, Internet of Things and Embedded System, Infrastructure Services as specializations

COURSE OUTCOME FOR BACHELOR OF INFORMATION TECHNOLOGY

F.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER I

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Programming Principles with C	T- USIT101 P- USIT1P1	CO 1. Understand different types of programming language and their development lifecycle with basic fundamentals of programming structure of C programming. CO 2. Understand various operators used for development of logic and also how to interact with the user by sending and receiving inputs. CO 3. Understand how to branch the logic and give it various possibilities along with making it work in loops and functions for effective presentation of logic and code. CO 3. Understand various aspects of compiler along with predefined syntax and structures like arrays for better processing of logic to get effective and faster results. CO 4. Understand higher level of structure which accepts different types of datatypes to work with and to build complex logic with help of these structures.
Digital Logic and Applications	T- USIT102 P- USIT1P2	CO 1. Explain analogy and digital systems, classification of number systems, codes and their conversions and perform binary arithmetic. CO 2. Explain the various types of logic gates, solve logical equations using Boolean equations, and explain the simplification of logical statements using Karnaugh maps. CO 3. Explain the concepts of multiplexer, demultiplexer, ALU, encoder, decoder and will be able to differentiate between combinational and sequential circuits.

		CO 4. Solve problems involving flip flops, design of counters and design of shift registers.
Fundamentals of Database Management Systems	T- USIT103 P- USIT1P3	CO 1. Define and describe the fundamental elements of relational database management system. CO 2. To relate the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. CO 3. Design ER-models to represent simple database application scenarios. CO 4. Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.
Computational Logic and Discrete Structure	T- USIT104 P- USIT1P4	CO 1. The student learns to use logical notation, perform logical proofs, CO 2. Apply recursive functions and solve recurrence relations., CO 3.can determine equivalent logic expressions, CO 4. Describe useful standard library functions, create functions, and declare parameters, CO 5. Use graphs and trees, Apply basic and advanced principles of counting.
Technical Communication Skills	T- USIT105 P- USIT1P5	CO 1. This course helps understand the nature of communication and focuses on business communication. CO 2. It also will enable the students to know different types of writing for business communication. CO 3. The course also helps in developing oral communication skills and understanding specific communication needs. CO 4. The course will provide lessons on improving presentation skills and practical activities to enhance communication skills.

F.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER II

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Object Oriented Programming with C++	T- USIT201 P- USIT2P1	CO 1. Understand Object Oriented Methodologies along with its principals and paradigm and also learn its basic concepts. CO 2. Understand working with different types of classes and objects used in this kind of programming along with usage of constructors and destructors. CO 3. Understand how logics can be moulded into different formats with the concept of polymorphism along with virtual functions. CO 4. Understand how to extend a class code with another class with the concept of inheritance and if there are any exceptions how to handle them using exception handling.
Fundamentals of Micro Processor and Microcontrollers	T- USIT202 P- USIT2P2	CO 1. Recall and apply basic concepts of digital fundamentals to Microprocessor based system. CO 2. Identify a detailed h/w and s/w structure (Assembly Language) of the 8085 microprocessors along with the tools for writing Assembly Language Program. CO 3. Demonstrate the skill in designing counters and time delay circuits along with the concept of stack and sub-routines. CO 4. Implement the code conversion and arithmetic circuits.
Web Applications Development	T- USIT203 P- USIT2P3	CO1: Learning Client server architecture CO2: Understanding website designing CO3: Implementation of CSS CO4: Learning types of CSS CO5: Table designing

		CO6: Understanding use of formatting tags CO7: Learning database connectivity CO8: Demonstrating food ordering and management system CO9: Understanding JavaScript CO10: Studying HTML5
Numerical Methods	T- USIT204 P- USIT2P4	CO 1.A student can derive numerical methods for various mathematical operations and tasks, such as interpolation, CO 2. Can solve Differentiation, integration, the solution of linear and nonlinear equations, CO 3. Can understand the application and solution of differential equations. CO 4. Analyse and evaluate the accuracy of common numerical methods.
Green IT	T- USIT205 P- USIT2P5	CO 1. Understand what Green IT is and how we can meet standards set for Green Computing CO 2. Comprehend Green IT from the perspective of hardware, software, storage, and networking at the enterprise levels. CO 3. Strategize Green Initiatives and look at the future of Green IT CO 4. discuss how the choice of hardware and software can facilitate a more sustainable operation, - use methods and tools to measure energy consumption.

S.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER III

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Python Programming	T- USIT301 P- USIT3P1	CO 1. Define and demonstrate the use of built-in data structures lists and dictionary. CO 2. Design and implement a program to solve a real-world problem. CO 3. Design and implement GUI application and how to handle exceptions and files. CO 4. Make database connectivity in python programming language.
Data Structures	T- USIT302 P- USIT3P2	CO 1. Understands the concept of algorithm complexity and will be able to calculate the time complexity of an algorithm. CO 2. get a thorough understanding of functionality and management of arrays. CO 3. write algorithms and code to perform various methods of sorting and searching. CO 4. Write code to define and operate linear data structures like stacks, queues and linked lists
Computer Networks	T- USIT303 P- USIT3P3	CO 1. Understand the general principles of data communication. CO 2. Understand how computer networks are organized with the concept of layered approach. CO 3. Understand how signals are used to transfer data between nodes. CO 4. Implement a simple LAN with hubs, bridges and switches.
Operating System	T- USIT304	CO 1. To learn basic

	P- USIT3P4	concepts and structure of operating systems CO 2. To learn about process and synchronization in operating system level. CO 3. To learn CPU scheduling algorithms. CO 4. To learn Memory and File system management. CO 5. To get knowledge of to handle threads, processes, process synchronization.
Applied Mathematics	T- USIT305 P- USIT3P5	CO 1, Solve problems in the related to Linear Algebra using matrices in complex numbers. CO 2. Analysing and solving engineering problems using Laplace Series. CO 3. solving engineering problems using Fourier Series.

S.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER IV

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Core Java	T- USIT401 P- USIT4P1	CO 1. Understand the features of java and differences between java and other languages. CO 2. Understand the JVM's role in compilation and execution of a java program. CO 3. Write code and execute in java to demonstrate its object-oriented features. CO 4. Write java programs to demonstrate salient features in java like multi-threading, packages
Introduction to embedded system	T- USIT402 P- USIT4P2	CO 1. Explain the concepts of embedded systems with examples, their core and their characteristics. CO 2. Identify a detailed h/w and s/w structure (Embedded C Language) of the 8051 microcontrollers along with the tools for writing Embedded C Language Program. CO 3. Demonstrate the skill in designing embedded system in various domains.
Computer Oriented Statistical Techniques	T- USIT403 P- USIT4P3	CO 1. A student learns to use a computer for the purpose of simulation in probability. CO 2.A student learns to use a computer for the purpose of simulation in probability. CO 3. He understands regression equations and their applications.
Software Engineering	T- USIT404 P- USIT4P4	CO 1. How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment

		CO 2. An ability to work in one or more significant application domains CO 3. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software CO 4. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
Computer Graphics and Animation	T- USIT405 P- USIT4P5	CO 1. Understand the need of Computer Graphics along with its application, software and hardware which supports graphics along with basic techniques like anti-aliasing to get better quality on the screen. CO 2. Understand various types of transformations like rotation, scaling etc and its conversions in two dimensional and three-dimensional formats. CO 3. Understand the basic fundamentals of animation like deformations and how image can be manipulated and stored in various formats

T.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER V

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Software Project Management	T- USIT501 P- USIT5P1	CO 1. Understand the concept of software project and different types of project and various development methods for the same. CO 2. Understand various project management concepts like activity planning, risk management, resource management etc. CO 3. Perform basic cost analysis and can calculate and analyse project duration, risk factors, resource allocation. CO 4. Choose a case-study or a real time project and apply these concepts analytically while developing the same. CO 5. Write a dissertation of their project case w.r.t. the concepts of software project management.
Internet of Things	T- USIT502 P- USIT5P2	CO 1. Explain the concepts of Internet of Things with examples, the technology involved and them characteristics. CO 2. Use the concepts of embedded system and explain the system on chips – the Raspberry Pi and Arduino. CO 3. Demonstrate the skill in designing Application Programming Interface for IoT devices.
Advanced Web	T- USIT503	CO 1. Understand .Net

Programming	P- USIT5P3	Framework along with Object based manipulation, conditional logics and implementation of namespaces and assemblies. Understand web form fundamentals, code behind class, event handlers along with form controls like auto post back methods. CO 2. Understand how to log and track the development process and also handle errors if any along with the state management of the tasks. Here they also learn how to style the application to make it more attractive for the user. CO 3. Understand how to connect with the database (ADO.Net), bind the data and also control the data flow from one end (client side) to another end (server side) and vice versa. CO 4. Understand the format in which XML communicates with database and client side keeping security in mind and also some advance controls of ASP.Net like AJAX.
Artificial Intelligence	T- USIT504 P- USIT5P4	CO 1. Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. CO 2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. CO 3. Demonstrate awareness

		and a fundamental understanding of various applications of AI. CO 4. Demonstrate hands-on experience through projects, showcasing the practical implementation of AI algorithms and models.
Next Generation Technologies	T- USIT507 P- USIT5P7	CO 1. Acquire a comprehensive understanding of emerging technologies, including blockchain, Internet of Things (IoT), and augmented reality& big Data. CO 2. Develop proficiency in programming languages relevant to next-generation technologies and their application in diverse contexts. CO 3. Demonstrate the ability to design and implement innovative solutions using cutting-edge technologies. CO 4. Gain insights into the ethical considerations and societal impacts of deploying next-generation technologies.
Project Dissertation	P- USIT5P1	CO 1. To build and develop deeper knowledge, understanding, capabilities and attitudes in the context of the programme of study. CO 2. Evaluate different types of allocations on different platforms in different areas. CO 3. To learn and create documentation using word processing software.

T.Y.B.Sc. - INFORMATION TECHNOLOGY– SEMESTER VI

After completing the course, the learner will be able to:

COURSE NAME	COURSE CODE	COURSE OUTCOME
Software Quality Assurance	T- USIT601 P- USIT6P1	CO 1. Understand the concept of quality in general and in the view of software project. CO 2. Through understanding of various testing methods that can be applied on a software project. CO 3. Understand various test artifacts like test document, test case, test plan etc. CO 4. Perform various black-box testing methods like EP&BVA, decision tables. CO 5. Perform structural testing methods like data flow testing, control flow testing, Path testing etc.
Security In Computing	T- USIT602 P- USIT6P2	CO 1. Identify some of the factors driving the need for network security. CO 2. Identify and classify particular examples of attacks CO 3. Define the terms vulnerability, threat and attack CO 4. Identify physical points of vulnerability in simple networks
Business Intelligence	T -USIT603 P -USIT6P3	C01: Learn the working of Decision Support System. C02: Demonstrate Mathematical models for decision making. C03: Learn the phases of Data Mining. C04: Understanding the difference between data validation and data transformation. C05: Learning Classification

		Algorithms.
Principles of Geographic Information Systems	T- USIT604 P- USIT6P4	CO 1. Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to. CO 2. Effectively communicate and present project results in oral, written, and graphic forms. CO 3. Demonstrate confidence in undertaking new (unfamiliar) analysis using GIS, troubleshoot problems in GIS, and seek help from software/website help menus and the GIS community to solve problems. CO 4. Apply mathematical concepts, including statistical methods, to data to be used in geospatial analysis. CO 5. Gather and process original data using a Global Positioning System (GPS) or other Global Navigation Satellite Systems (GNSS).
Cyber Laws & Advanced Mobile Programming Practical	T- USIT607 & P- USIT6P7	CO 1. Makes students Conversant with The Social and Intellectual Property Issues Emerging From 'Cyberspace. CO 2. Understands the nature of Cyber-crime. CO 3. Gets an overview of Legislations and Laws of Cyber world. CO 4. Explore The Legal and Policy Developments in Various Countries to regulate

		Cyberspace. CO 5. Develops the Understanding of Relationship Between Commerce and Cyberspace. CO-5 Basic Android Development tools such as Android, DDMS, Drawable, Listeners, and so on. CO-6 How to use various Layouts and Widgets in Android Applications. CO-7 How to create interactive applications in android with multiple activities including audio, video and notifications. CO-8 How to create applications using SQLite database. CO-9 How to publish your App on Google Play.
Project Implementation	USIT6P1	CO 1. To understand the building of real time projects. the actual work environment, real time problems and problem-solving techniques of real time projects. CO 2. To build and develop deeper knowledge, understanding, capabilities and attitudes in the context of the programme of study. CO 3. Evaluate different types of allocations on different platforms in different areas. CO 4. To learn and create documentation using word processing software.