Mahatma Gandhi Mission's
College of Computer Science and Information Technology
Department of Information Technology

BSc Information Technology

Program Outcomes, Program Specific Outcomes and Course Outcomes

Program Outcomes:

PO1	Acquire understanding about Information Technology and its Concepts
PO2	Get skills to conduct Programming & analyse the outputs
PO3	Study methods to handle Computer and electronics equipment, programming on Microprocessor Architecture and High level and Assembly Languages
PO4	Apply the knowledge of mathematics, skill enhancement course and skill development Languages into Software Project Management
PO5	To apply know-how about modern computer languages, trends, platforms in creating advanced career paths to be an entrepreneur, and a passion for higher studies.
PO6	Study the knowledge for software design and development, practices to develop software applications in emerging areas such as Java and Artificial Intelligence, Business Intelligence and Cyber security.
PO7	Supportive for going for higher studies with good knowledge in principal domains of Information Technology, by being informed of modern tools and techniques, and good interactive and social and technical communication skills.
PO8	Gain knowledge of recent trends and openings for better placement or Further Higher education
PO9	Attain skills to display professionalism, team work, leadership skills and expose to current needs of the IT industry in general.
P10	Gain knowledge, skills and techniques which are emerging in the field of IT, critical thinking, Honesty and Professional Ethics.

Program Specific Outcomes:

PSO1	The program will help learners to study and attain ability in different domains of Information Technology, providing them the opportunity to learn new technologies.
PSO2	The learners will be able to understand and develop fundamental programming logic and implementation skills and will be able to write programs using existing programming language and techniques as per the IT industry needs and benchmarks.
PSO3	The learner will be able to understand and apply essential systems for use of technology and resource sharing. They will also have full knowledge and skills to design databases, software applications, mobile applications and web-based applications

Course Outcomes:

FY BSc IT Semester 1

Course Name:	**USIT Programming Principles with C**
Course Code:	**USIT101**
CO1	Learners will learn basic principles of programming
CO2	Develop of logic using algorithm and flowchart.
CO3	Acquire the information about data types.
CO4	Understanding of input and output functions.
CO5	Enhance advanced concepts using program.

Course Name:	**USIT Digital Logic and Applications**
Course Code:	**USIT102**
CO1	Apply number conversion techniques in real digital systems
CO2	Solve Boolean algebra expressions
CO3	Derive and design logic circuits by applying minimization in SOP and POS forms
CO4	Design and develop Combinational and Sequential circuits
CO5	Understand and develop digital applications

Course Name:	**USIT Fundamentals of Database Management Systems**
Course Code:	**USIT103**
CO1	Define and describe the fundamental elements of relational database management system.
CO2	To relate the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
CO3	Design ER-models to represent simple database application scenarios.
CO4	Transform the ER-model to relational tables, populate relational database and formulate SQL queries on data. Improve the database design by normalization.
CO5	Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.

Course Name:	**USIT Computational Logic and Discrete Structures**
Course Code:	**USIT104**
CO1	Use logical notation. Perform logical proofs
CO2	Apply recursive functions and solve recurrence relations
CO3	Use graphs and trees
CO4	Apply basic and advanced principles of counting
CO5	Define sets and Relations. Calculate discrete probabilities.

Course Name:	**USIT Technical Communication Skills**
Course Code:	**USIT105**
CO1	Analyse, synthesize and utilize the process and strategies from delivery to solving communication problem.
CO2	Learn the communication methodologies at workplace and learning about importance of team collaboration.
CO3	Learn about different technical communication such as presentations and interviews.
CO4	Understand and apply the art of written communication in writing reports, proposals.
CO5	Ground rules of ethical communication and MIS. Understand the functions of graphs, maps, charts.

Course Outcomes:

FY BSc IT Semester 2

Course Name:	**USIT Object Oriented Programming with C++**
Course Code:	**USIT201**
CO1	Understand the concept of OOPs, feature of C++ language. Understand and apply various types of DataTypes, Operators, and Conversions while designing the program.
CO2	Understand and apply the concepts of Classes &Objects, friend function, constructors & destructors in program design.
CO3	Design & implement various forms of inheritance, String class, calling base class constructors.
CO4	Apply & Analyse operator overloading, runtime polymorphism, Generic Programming.
CO5	Analyse and explore various Stream classes, I/O operations and exception handling.

Course Name:	**USIT Fundamentals of Micro Processor and Microcontrollers**
Course Code:	**USIT202**
CO1	Understand the basic concepts of Micro Computer Systems
CO2	Understand the architecture and hardware aspects of 8085
CO3	Write assembly language programs in 8085
CO4	Design elementary aspects of Micro Controller based systems
CO5	Interfacing peripherals using Micro Controller

Course Name:	**USIT Web Applications Development**
Course Code:	**USIT203**
CO1	Analyse working of Internet. Gain an insight into designing web pages.
CO2	Use different ways of styling web pages using CSS.
CO3	Implement basic and complex functionalities of JavaScript in a web page.
CO4	Employ PHP Scripts to execute dynamic tasks in a web page.
CO5	Perform various database tasks using PHP.

Course Name:	**USIT Numerical Methods**
Course Code:	**USIT204**
CO1	Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations.
CO2	Understand the different operators and the use of interpolation.
CO3	Understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.
CO4	Learn solution of Algebraic and Transcendental equations
CO5	Understand Least Square Regression.

Course Name:	**USIT Green IT**
Course Code:	**USIT205**
CO1	Understand the concept of Green IT and problems related to it. Know different standards for Green IT.
CO2	Understand the how power usage can be minimized in Technology.
CO3	Learn about how the way of work is changing.
CO4	Understand the concept of recycling.
CO5	Know how information system can stay Green Information system.

Course Outcomes:

SY BSc IT Semester 3

Course Name:	**Python Programming**
Course Code:	**USIT301**
CO1	Learn the basic features variables, operators, Maths related functions, Decision making statement
CO2	Absorb different functions & strings
CO3	Understand and summarise Lists, Tuples, Dictionaries, File handling
CO4	Interpret object oriented programming
CO5	Learn GUI applications in Python

Course Name:	**Data Structure**
Course Code:	**USIT302**
CO1	Understand the basics of algorithm analysis
CO2	Understand and describe operations on Linked list
CO3	Understand and analyse stack and queue operations
CO4	Understand different sorting techniques, trees and AVL tree
CO5	Understand and analyse graph and hashing techniques

Course Name:	**Computer Network**
Course Code:	**USIT303**
CO1	Understand the basics of Computer Networking
CO2	Understand different transmission mediums
CO3	Understand and analyse wired and wireless networking technologies
CO4	Understand functionality of Network layer.
CO5	Understand various transportation protocols

Course Name:	**Database Management System**
Course Code:	**USIT304**
CO1	Understand the basics of relational database management system
CO2	Understand different concepts of relational data model, entity relationship model, design and relational algebra and SQL
CO3	Understand and design ER Models and transform it to relational tables and formulate SQL queries
CO4	To learn basic PL/SQL programming and develop efficient programs, access Oracle database using control structure, exception handling cursors.
CO5	To perform the advanced PL/SQL programming

Course Name:	**Applied Mathematics**
Course Code:	**USIT305**
CO1	Understand the solution of Matrices using methods like polar, exponential form of complex and hyperbolic functions.
CO2	Learners will solve differential equations using various methods and differential equations with constant coefficient.
CO3	Understand properties of Laplace and integrate Laplace transform and inverse Laplace using differential equation.
CO4	Learn to find double and triple integrals in polar coordinates and area, volume using double and triple integrals
CO5	Understand the properties of beta, gamma functions and solve error functions.

Course Outcomes:

SY BSc IT Semester 4

Course Name:	**USIT Core Java**
Course Code:	**USIT401**
CO1	Understand the basic concepts and terminologies of Java
CO2	Learners will be able to develop Java code using control structure, iteration.
CO3	Understand and use the advance class features like inheritance, polymorphism and overloading, overriding, interface. Abstract classes and develop efficient and reusable codes
CO4	Understand the concepts of multi-threading, IO file handling and exception handling.
CO5	Learners will be able to design, develop and execute AWT applications.

Course Name:	**USIT Introduction to Embedded Systems**
Course Code:	**USIT402**
CO1	Learners will become familiar with classification, characteristics, core components of embedded system
CO2	Learners will be able to understand memory, types of memory, registers.
CO3	Acquire skills in 8051 programming in C
CO4	Understand the concepts of selecting microcontroller and developing basic applications.
CO5	Understand different types of Operating Systems and their characteristics.

Course Name:	**USIT Computer Oriented Statistical Techniques**
Course Code:	**USIT403**
CO1	Learners will be able to calculate and apply measures of dispersion.
CO2	To apply discrete and continuous probability distribution to various problems.
CO3	Learners will test the hypothesis as well as calculate confidence interval ad the p-concept.
CO4	To learn non-parametric test such as Chi-square test for independence and goodness for fit.
CO5	To compute and interpret the results of bivariate regression and correlation analysis and to perform ANOVA

Course Name:	**USIT Software Engineering**
Course Code:	**USIT404**
CO1	Learners will be able to apply the software engineering life cycle by demonstrating competence in communication, planning, analysis, design and deployment
CO2	To have ability to work in one or more significant application domain
CO3	To work as individual and as a team member to develop and deliver quality software
CO4	Understand and apply current theories, models and techniques that provide basis of software life cycle.
CO5	Learners will be able to use the techniques and tools necessary for engineering practices.

Course Name:	**USIT Computer Graphics and Animation**
Course Code:	**USIT405**
CO1	Learners will be able to apply the concepts of computer graphics.
CO2	Learners will able to understand 2D / 3D transformation and its types
CO3	To create 3D objects using lines and colour
CO4	To create different objects with different planes, curves.
CO5	To do animations through programming

Course Outcomes:

TY BSc IT Semester 5

Course Name:	**Software Project Management**
Course Code:	**USIT501**
CO1	Learners will be able to clear the idea about project planning.
CO2	Learners will be able to determine Success criteria for a project.
CO3	Learners will be able to reduce some risk certain of appropriate prototype
CO4	Learners will be able to determine, estimate the overall duration of project.
CO5	Learners will be able to Identify the resource requirements.

Course Name:	**Internet of Things**
Course Code:	**USIT502**
CO1	Learners will be able to Interpret the vision of IoT from a global context
CO2	Learners will be able to become familiar with IoT hardware components
CO3	Learners will be able to acquire skills to design 3D modules
CO4	Learners will be able to determine the Market perspective of IoT
CO5	Learners will be able to acquire skills on developing their enterprise level technical strategies

Course Name:	**Advanced Web Programming**
Course Code:	**USIT503**
CO1	Learners will be able to do programming with C# Language.
CO2	Learners will be able to acquire skills to design web page incorporate with different server controls on web pages.
CO3	Learners will be able to acquire skills to handle Error Handling, Logging, and Tracing , State Management
CO4	Learners will be able to acquire skills to develop dynamic web pages using ADO.NET Fundamentals
CO5	Learners will be able to provide interaction between web pages using ASP.NET AJAX.

Course Name:	**Artificial Intelligence**
Course Code:	**USIT504**
CO1	Learners will be able to understand Foundations of AI, agents and environment, nature of environment, the structure of agents. Problem solving agents, examples problems, searching for solutions, uninformed search, informed search strategies, heuristic functions.
CO2	Learners will be able to handle local search algorithms, searching with non-deterministic action, searching with partial observations, online search agents and unknown environments
CO3	Learners will be able to configure optimal decisions in games, alpha-beta pruning, stochastic games, partially observable games, state-of-the-are game programs.
CO4	Learners will be able to acquire skills to understand Syntax and semantics, using First Order Logic, Knowledge engineering in First Order Logic
CO5	Learners will be able to definition of Classical Planning, Algorithms for planning as state space search, planning graphs,

Course Name:	**Enterprise Java**
Course Code:	**USIT506**
CO1	Learners will be able to create servlet and develop java applications with database connectivity.
CO2	Learners will study the fundamentals and core concepts of cookies, session, file uploading, file downloading and request dispatcher
CO3	Learners will gain knowledge and experience required to develop and deploy JSP application using JSTL.
CO4	Learners will be able to develop and deploy EJB application with concepts of Interceptors, JNDI.
CO5	Learners will be familiar with the development of application using concept of Persistence, Object/Relational Mapping, JPA and Hibernate.

Course Outcomes:

TY BSc IT Semester 6

Course Name:	**Software Quality Assurance**
Course Code:	**USIT601**
CO1	Able to analyse the quality of software product
CO2	Understands the Fundamentals of Testing
CO3	Understands different testing methodology also analyse the difference between black box and white box testing
CO4	Understand different verification and validation techniques and V-test Models
CO5	Understand special types of testing and levels of testing

Course Name:	**Security in Computing**
Course Code:	**USIT602**
CO1	Understands the basics of information security with risk analysis and design principles
CO2	Learners will be able to identify some of the factors driving the need for Database and storage security also understands the concept of Authentication and Authorization
CO3	Learners will be able to identify some of the factors driving the need for Network security
CO4	Learners will be able to gather information about multiple attacks, vulnerabilities and how to detect & prevent them.
CO5	Learners will be aware of information about cloud storage, virtualization and how to secure them

Course Name:	**Business Intelligence**
Course Code:	**USIT603**
CO1	Learners will be able to Identify the major frameworks of computerized decision support: decision support systems (DSS), data analytics and business intelligence.
CO2	Learners will be able to analyse data, choose relevant models and algorithms for respective applications
CO3	Learners will be able to become familiar with classification methods, clustering methods.
CO4	Learners will be able to design application using Business Intelligence techniques.
CO5	Learners will be able to ability to design and develop the AI applications in real world

Course Name:	**Principles of Geographic Information Systems**
Course Code:	**USIT604**
CO1	Understand the concept of GIS, GI Systems, GI Science and GI Applications, Spatial data and Geo-information.
CO2	Study of Regular tessellations, irregular tessellations, Vector representations, Topology and Spatial relationships, Scale and Resolution, Representation of Geographic fields, Representation of Geographic objects
CO3	Stages of Spatial Data handling, Spatial data handling and Preparation, Spatial Data Storage and maintenance.
CO4	Understand Spatial Referencing: Reference surfaces for mapping, Coordinate Systems, Map Projections, Coordinate Transformations
CO5	Retrieval, classification and measurement: Measurement, Spatial selection queries, Classification Overlay functions: Vector overlay operators, Raster overlay operators

Course Name:	**IT Service Management**
Course Code:	**USIT606**
CO1	Make Learner Conversant with Business Process, Principles of Service Management Specialisation and Coordination, The agency principle, Encapsulation, Principles of systems
CO2	Service Design Principles: Goals, Balanced Design, Identifying Service requirements, business requirements and drivers, Design constraints, Service oriented architecture, Business Service Management.
CO3	Understand Service Transition Principles: Principles Supporting Service Transition, Policies for Service Transition. Service Transition Processes, Service Operation, Achieving balance in service operations.
CO4	Make the learners understand CSI Approach, CSI and organizational change, Service Measurement, IT governance, CSI inputs and outputs. CSI Process, CSI Methods and Techniques.
CO5	Understand tools to support CSI activities. Implementing CSI: Critical Considerations for implementing CSI, The start, Governance, CSI and organisational change, Communication Strategy and Plan

Mahatma Gandhi Mission's
College of Computer Science and Information Technology
Department of Computer Science

BSc (Computer Science)

Program Outcomes, Program Specific Outcomes and Course Outcomes

Program Outcomes:

PO1	To formulate, to model, to design solutions, procedure and to use software tools to solve real world problems.
PO2	To design and develop computer programs/computer -based systems in the areas such as networking, web design, security, cloud computing, IoT, data science and other emerging technologies.
PO3	To familiarize with the modern-day trends in industry and research based settings and thereby innovate novel solutions to existing problems.
PO4	To apply concepts, principles, and theories relating to computer science to new situations.
PO5	To use current techniques, skills, and tools necessary for computing practice.
PO6	To apply standard Software Engineering practices and strategies in real-time software project development
PO7	To pursue higher studies of specialization and to take up technical employment.
PO8	To work independently or collaboratively as an effective tame member on a substantial software project.
PO9	To communicate and present their work effectively and coherently.
P10	To display ethical code of conduct in usage of Internet and Cyber systems.
P11	To engage in independent and life-long learning in the background of rapid changing IT industry.

Program Specific Outcomes

PSO1	Impart socially adequate technical solutions to complicated computer science problems with the application of appropriate techniques for sustainable development relevant to specialized practice.
PSO2	Apply the skills of ethical and management principles required to work in a team as well as to lead a team.
PSO3	Figure out and write effective project reports in multidisciplinary environment in the context of changing technologies

Course Outcomes:

FY BSc CS Semester 1

Course Name:	**USCS Digital Systems & Architecture**
Course Code:	**USCS101**
CO1	To learn about how computer systems work and underlying principles
CO2	To understand the basics of digital electronics needed for computers
CO3	To understand the basics of instruction set architecture for reduced and complex instruction sets
CO4	To understand the basics of processor structure and operation, how data is transferred between the processor and I/O devices

Course Name:	**USCS Introduction to Programming with Python**
Course Code:	**USCS102**
CO1	Ability to store, manipulate and access data in Python
CO2	Ability to implement basic Input / Output operations in Python
CO3	Ability to define the structure and components of a Python program and how to write functions and pass arguments.
CO4	Ability to learn how to write loops and decision statements, in Python.

Course Name:	**USCS LINUX Operating System**
Course Code:	**USCS103**
CO1	Work with Linux file system structure, Linux Environment
CO2	Handle shell commands for scripting, with features of regular expressions, redirections
CO3	Implement file security permissions and Install software like compilers and develop programs in C and Python programming languages on Linux Platform
CO4	Work with vi, sed and awk editors for shell scripting using various control structures

Course Name:	**USCS Open Source Technologies**
Course Code:	**USCS104**
CO1	Differentiate between Open Source and Proprietary software and Licensing.
CO2	Recognize the applications, benefits and features of Open-Source Technologies
CO3	Gain knowledge to start, manage open-source projects.
CO4	Understanding Open-Source Ecosystem, Case Studies: Example Projects: Apache Web server, BSD, GNU/Linux, Android, Mozilla etc

Course Name:	**USCS Discrete Mathematics**
Course Code:	**USCS105**
CO1	Define mathematical structures (relations, functions, graphs) and use them to model real life situations.
CO2	Understand, construct and solve simple mathematical problems.
CO3	Solve puzzles based on counting principles. Develop an attitude to solve problems based on graphs and trees, which are widely used in software.
CO4	Provide basic knowledge about models of automata theory and the corresponding formal languages.

Course Name:	**USCS Descriptive Statistics**
Course Code:	**USCS106**
CO1	Organize, manage and present data.
CO2	Analyse Statistical data using measures of central tendency and dispersion.
CO3	Analyse Statistical data using basics techniques of R. Concept of dependent (response) and independent (Predictor) variables, concept of regression, Types and prediction.
CO4	Study the relationship between variables using techniques of correlation and regression

Course Name:	**USCS Soft Skills**
Course Code:	**USCS107**
CO1	Learners will be able to understand the importance and types soft skills
CO2	Learners will develop skills for Academic and Professional Presentations. Learn about leadership, Creativity at Workplace, Team Building and Decision Making
CO3	Learners will able to understand Leadership Qualities and Ethics.
CO4	Ability to understand the importance of stress management in their academic & professional life.

Course Outcomes:

FY BSc CS Semester 2

Course Name:	**USCS Design & Analysis of Algorithms**
Course Code:	**USCS201**
CO1	Understand and evaluate efficiency of the programs that they write based on performance of the algorithms used.
CO2	Appreciate the use of various data structures as per need, Learn Algorithm Design Techniques, Backtracking Programming
CO3	To select, decide and apply appropriate design principle by understanding the requirements of any real life problems
CO4	To understand Recursion, Recursive Design, Recursion application.

Course Name:	**USCS Advanced Python Programming**
Course Code:	**USCS202**
CO1	Ability to implement OOP concepts in Python including Inheritance and Polymorphism
CO2	Ability to work with files and perform operations on it using Python. Knowledge of working with databases, designing GUI in Python and implement networking in Python.
CO3	Ability to implement regular expression and concept of threads for developing efficient program
CO4	Ability to implement exception handling in Python applications for error handling.

Course Name:	**USCS Introduction to OOPs using C++**
Course Code:	**USCS203**
CO1	Work with numeric, character and textual data and arrays.
CO2	Understand the importance of OOP approach over procedural language.
CO3	Understand how to model classes and relationships using UML. Handle basic file operations.
CO4	Apply the concepts of OOPS like encapsulation, inheritance and polymorphism.

Course Name:	**USCS Database Systems**
Course Code:	**USCS204**
CO1	To appreciate the importance of database design. Create indexes and understands the role of Indexes in optimization search
CO2	Analyse database requirements and determine the entities involved in the system and their relationship to one another. Write simple queries to MySQL related to String, Maths and Date Functions.
CO3	Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands.

CO4	Understand the normalization and its role in the database design process. Handle data permissions.

Course Name:	**USCS Calculus**
Course Code:	**USCS205**
CO1	Develop mathematical skills and enhance thinking power of learners.
CO2	Understand mathematical concepts like limit, continuity, derivative, integration of functions, partial derivatives.
CO3	Appreciate real world applications which use the learned concepts.
CO4	Skill to formulate a problem through Mathematical modelling and simulation.

Course Name:	**USCS Statistical Methods**
Course Code:	**USCS206**
CO1	Calculate probability, conditional probability and independence.
CO2	Apply the given discrete and continuous distributions whenever necessary. Apply non-parametric test whenever necessary.
CO3	Define null hypothesis, alternative hypothesis, level of significance, test statistic and p value. Conduct and interpret one-way and two-way ANOVA
CO4	Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.

Course Name:	**USCS E-Commerce & Digital Marketing**
Course Code:	**USCS207**
CO1	Understand the core concepts of E-Commerce. Understand the significance of Web Analytics and Google Analytics and apply the same.
CO2	Understand the various online payment techniques. Apply digital marketing through different channels and platforms
CO3	Understand the core concepts of digital marketing and the role of digital marketing in business.
CO4	Apply digital marketing strategies to increase sales and growth of business.

Course Outcomes:

SY BSc CS Semester 3

Course Name:	**USCS Principles of Operating System**
Course Code:	**USCS301**
CO1	Work with any type of operating system
CO2	Handle threads, processes, process synchronization
CO3	Implement CPU scheduling algorithms. Design file system.

CO4	Understand the background role of memory management

Course Name:	**USCS Linear Algebra**
Course Code:	**USCS302**
CO1	Appreciate the relevance and applications of Linear Algebra in the field of Computer Science.
CO2	Understand the concepts through program implementation. Find eigenvalues and corresponding eigenvectors for a square matrix.
CO3	Instil a computational thinking while learning linear algebra.
CO4	Express clear understanding of the concept of a solution to a system of equations.

Course Name:	**USCS Data Structures**
Course Code:	**USCS303**
CO1	Create different types of data structures.
CO2	Understand which data structure to be used based on the type of the problem.
CO3	Apply combined knowledge of algorithms and data structures to write highly effective programs in various domains.
CO4	Design Programs using Link Lists, Stack, Queue and Trees

Course Name:	**USCS Advanced Database Concepts**
Course Code:	**USCS304**
CO1	Master concepts of stored procedure, functions, cursors and triggers and its use.
CO2	Learn about using PL/SQL for data management.
CO3	Use efficiently Collections and records. Develop programming concepts of database.
CO4	Understand concepts and implementations of transaction management and crash recovery.

Course Name:	**USCS Java based Application Development**
Course Code:	**USCS305**
CO1	Design basic application in java using Graphical User Interface.
CO2	Develop applications using swings
CO3	Develop web based applications using servlet and jsp. Perform programs using JSON objects
CO4	Connect databases with java through

Course Name:	**USCS Web Technologies**
Course Code:	**USCS306**
CO1	Design valid, well-formed, scalable, and meaningful pages using emerging technologies.

CO2	Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites. Design and apply XML to create a markup language for data and document centric applications.
CO3	Develop and implement client-side and server-side scripting language programs.
CO4	Develop and implement Database Driven Websites.

Course Name:	**USCS Green Technologies**
Course Code:	**USCS307**
CO1	Explain drivers and dimensions of change for Green Technology
CO2	Appreciate Virtualization; smart meters and optimization in achieving green IT
CO3	Gain knowledge about green assets, green processes, and green enterprise architecture
CO4	ISO 14001 and related standards for Audit for Green Compliance

Course Outcomes:

SY BSc CS Semester 4

Course Name:	**USCS Theory of Computation**
Course Code:	**USCS401**
CO1	Understand Grammar and Languages
CO2	Learn about Automata theory and its application in Language Design
CO3	Learn about Turing Machines and Pushdown Automata. Learn about finite state machines to solve problems in computing
CO4	Understand Linear Bound Automata and its applications

Course Name:	**USCS Computer Networks**
Course Code:	**USCS402**
CO1	Learn basic networking concepts and layered architecture.
CO2	Understand the concepts of networking, which are important for them to be known as a networking professionals.
CO3	Network layer performance, IPv4 addressing, forwarding of IP packets
CO4	Transport Layer Protocol, User Datagram Protocol

Course Name:	**USCS Software Engineering**
Course Code:	**USCS403**
CO1	Plan a software engineering process life cycle, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements

CO2	Analyse and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
CO3	Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice
CO4	Able to use modern engineering tools necessary for software project management, time management and software reuse.

Course Name:	**USCS IoT Technologies**
Course Code:	**USCS404**
CO1	Understand SoC and IoT
CO2	Use different types of IoT Platforms and interfaces
CO3	Understand and implement an idea of various types of applications built using IoT
CO4	Interfacing various types of devices using different protocols with IoT

Course Name:	**USCS Android Application Development**
Course Code:	**USCS405**
CO1	Build useful mobile applications using Kotlin language on Android
CO2	Install and configure Android Studio for application development. Master key Android programming concepts
CO3	Master basic to intermediate concepts of Kotlin required for mobile application development. Deploy the application on Google Play
CO4	Use built-in widgets and components, work with the database to store data

Course Name:	**USCS Advanced Application Development**
Course Code:	**USCS406**
CO1	Store the data in NoSQL, document-oriented MongoDB database that brings performance and scalability
CO2	Use Node.js and Express Framework for building fast, scalable network applications
CO3	Use AngularJS framework that offers declarative, two-way data binding for web applications.
CO4	Integrate the front-end and back-end components of the MEAN stack. Develop robust mobile applications using Flutter.

Course Name:	**USCS Management & Entrepreneurship**
Course Code:	**USCS407**
CO1	Understand the meaning of management, functions, administration and its process.
CO2	Understand the foundation of entrepreneurship and its theory, types and its process.
CO3	Identify the steps involved in an entrepreneurial venture (SSI).

CO4	Understand an entrepreneur is converting his business ideas into running concern by selecting the project.

Course Outcomes:

TY BSc CS Semester 5

Course Name:	**USCS Artificial Intelligence**
Course Code:	**USCS501**
CO1	Learner should get a clear understanding of AI and different search algorithms used for solving problems.
CO2	The learner should also get acquainted with different learning algorithms and models used in machine learning.
CO3	Theory of Learning, Regression and Classification with Linear Models, Artificial Neural Networks, Nonparametric Models, Support Vector Machines, Ensemble Learning, Practical Machine Learning
CO4	Statistical Learning, Learning with Complete Data, Learning with Hidden Variables: The EM Algorithm.
CO5	Passive Reinforcement Learning, Active Reinforcement Learning

Course Name:	**USCS Software Testing and Quality Assurance**
Course Code:	**USCS503**
CO1	Understand various software testing methods and strategies.
CO2	Understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
CO3	Design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.
CO4	Formal Technical Reviews, Formal approaches to SQA
CO5	The ISO 9000 Quality Standards, , SQA Plan , Six sigma, Informal Reviews

Course Name:	**USCS Information and Network Security**
Course Code:	**USCS504**
CO1	Understand the principles and practices of cryptographic techniques.
CO2	Understand a variety of generic security threats and vulnerabilities, and identify & analyze particular security problems for a given application.
CO3	Understand various protocols for network security to protect against the threats in a network.
CO4	Digital Signatures, Authentication Protocols, Digital Signature Standard
CO5	Firewall Design Principles, Types of Firewalls

Course Name:	**USCS Web Services**
Course Code:	**USCS506**
CO1	Emphasis on SOAP based web services and associated standards such as WSDL. Design SOAP based / RESTful / WCF services Deal with Security and QoS issues of Web Services.
CO2	Understand the details of web services technologies like SOAP, WSDL, and UDDI.
CO3	The design principles and application of SOAP and REST based web services (JAX-Ws and JAX-RS).
CO4	Design secure web services and QoS of Web Services
CO5	Learn how to implement and deploy web service client and server.

Course Name:	**USCS Game Programming**
Course Code:	**USCS507**
CO1	Learner should study Graphics and gamming concepts with present working style of developers where everything remains on internet and they need to.
CO2	Learner should get the understanding computer Graphics programming using Directx or Opengl.
CO3	Along with the VR and AR they should also aware of GPU, newer technologies and programming using most important API for windows.
CO4	The Trigonometric Ratios, Inverse Trigonometric Ratios, Trigonometric Relationships
CO5	Review Gaming Concepts, understand, be a part of community and learn

Course Outcomes:

TY BSc CS Semester 6

Course Name:	**USCS Wireless Sensor Networks and Mobile Communication**
Course Code:	**USCS601**
CO1	After completion of this course, learner should be able to list various applications of wireless sensor networks, describe the concepts, protocols, design, implementation and use of wireless sensor networks.
CO2	Implement and evaluate new ideas for solving wireless sensor network design issues.
CO3	Learner should be able to conceptualize and understand the framework.
CO4	Learners will be able to have a firm grip over this very important segment of wireless network
CO5	Mobile services, System architecture, Radio interface, Protocols, Localization And Calling, Handover, security, New data services

Course Name:	**USCS Cyber Forensics**
Course Code:	**USCS603**
CO1	The student will be able to plan and prepare for all stages of an investigation - detection, initial response and management interaction, investigate various media to collect evidence, report them in a way that would be acceptable in the court of law.
CO2	Understand the procedures for identification, preservation, and extraction of electronic evidence, auditing and investigation of network and host system intrusions, analysis and documentation of information gathered
CO3	Introduction to Network Forensics and tracking network traffic, Acquisition Procedures for Cell Phones and Mobile Devices
CO4	Wide Web Threats, Hacking and Illegal access.
CO5	Laws & regulations, Information Technology Act, Giving Evidence in court.

Course Name:	**USCS Information Retrieval**
Course Code:	**USCS604**
CO1	Learner should get an understanding of the field of information retrieval and its relationship to search engines.
CO2	Learner will get an understanding to apply information retrieval models.
CO3	Overview of the important issues in classical and web information retrieval.
CO4	Up-to- date treatment of all aspects of the design and implementation of systems for gathering, indexing
CO5	Searching documents and of methods for evaluating systems

Course Name:	**USCS Data Science**
Course Code:	**USCS606**
CO1	Understanding basic data science concepts. The students should be able to understand & comprehend the problem
CO2	Learner should be able to define suitable statistical method to be adopted.
CO3	Learners should be able to detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization.
CO4	Make aware of how to address advanced statistical situations
CO5	Modelling and Machine Learning.

Course Name:	**USCS Ethical Hacking**
Course Code:	**USCS607**
CO1	Learner will know to identify security vulnerabilities and weaknesses in the target applications.
CO2	They will also know to test and exploit systems using various tools and understand the impact of hacking in real time machines.
CO3	To understand the ethics, legality, methodologies and techniques of hacking
CO4	White Hat (Ethical) hacking, Why is Ethical hacking needed? How is Ethical hacking different from security auditing and digital forensics?
CO5	Gaining and Maintaining Access, Additional security mechanism