PROGRAMME OUTCOMES

PO 1 : To formulate, to model, to design solutions, procedure and to use software tools to solve real world problems.

PO 2 : 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.

PO 3 : To familiarize with the modern-day trends in industry and research based settings and thereby innovate novel solutions to existing problems.

PO 4 : To apply concepts, principles, and theories relating to computer science to new situations.

PO 5 : To use current techniques, skills, and tools necessary for computing practice.

PO 6 : To apply standard Software Engineering practices and strategies in real-time software project development.

PO 7 : To pursue higher studies of specialization and to take up technical employment.

PO 8 : To work independently or collaboratively as an effective tame member on a substantial software project.

PO 9 : To communicate and present their work effectively and coherently.

PO 10 : To display ethical code of conduct in usage of Internet and Cyber systems.

PO 11 : To engage in independent and life-long learning in the background of rapid changing IT industry.

COURSE OUTCOMES

Semester I	
Course name	**Course outcomes**
Digital Systems & Architecture (USCS101)	CO 1: Students would be able to learn about how computer systems work and underlying principles CO 2: To understand the basics of digital electronics needed for computers CO 3: To understand the basics of instruction set architecture for reduced and complex instruction sets CO 4: To understand the basics of processor structure and operation CO 5: To understand how data is transferred between the processor and I/O devices
Introduction to Programming with Python(USCS102)	CO 1: Ability to store, manipulate and access data in Python CO 2: Ability to implement basic Input / Output operations in Python CO 3 Ability to define the structure and components of a Python program. CO 4: Ability to learn how to write loops and decision statements in Python. CO 5: Ability to learn how to write functions and pass arguments in Python. CO 6: Ability to create and use Compound data types in Python
LINUX Operating System (USCS103)	CO 1 : Work with Linux file system structure, Linux Environment Handle shell commands for scripting, with features of regular expressions, redirections CO 2: Implement file security permissions CO 3: Work with vi, sed and awk editors for shell scripting using various control structures CO 4: Install software like compilers and develop programs in C and Python programming languages on Linux Platform
Open Source Technologies (USCS104)	CO 1: Differentiate between Open Source and Proprietary software and Licensing. CO 2: Recognize the applications, benefits and features of Open-Source Technologies CO 3: Gain knowledge to start, manage open-source projects.
Discrete Mathematics (USCS105)	CO 1: Define mathematical structures (relations, functions, graphs) and use them to model real life situations. CO 2: Understand, construct and solve simple mathematical problems. CO 3: Solve puzzles based on counting principles. CO 4: Provide basic knowledge about models of automata theory and the corresponding formal languages. CO 5: Develop an attitude to solve problems based on graphs and trees, which are widely used in software.

Descriptive Statistics (USCS106)	CO 1: Learner will able to organize, manage and present data. CO 2: Analyse Statistical data using measures of central tendency and dispersion. CO 3: Analyse Statistical data using basics techniques of R. CO 4: Study the relationship between variables using techniques of correlation and regression.
Soft Skills (USCS107)	CO 1: Learners will be able to understand the importance and types soft skills CO 2: Learners will develop skills for Academic and Professional Presentations. CO 3: Learners will able to understand Leadership Qualities and Ethics. CO 4: Ability to understand the importance of stress management in their academic & professional life.
Semester II	
Course name	**Course outcomes**
Design & Analysis of Algorithms (USCS201)	CO 1: Students should be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used. CO 2: Students should be able to appreciate the use of various data structures as per need CO 3: To select, decide and apply appropriate design principle by understanding the requirements of any real life problems
Advanced Python Programming (USCS202)	CO 1: Ability to implement OOP concepts in Python including Inheritance and Polymorphism CO 2: Ability to work with files and perform operations on it using Python. CO 3: Ability to implement regular expression and concept of threads for developing efficient program CO 4: Ability to implement exception handling in Python applications for error handling. CO 5: Knowledge of working with databases, designing GUI in Python and implement networking in Python.
Introduction to OOPs using C++ (USCS203)	CO 1: Work with numeric, character and textual data and arrays. CO 2: Understand the importance of OOP approach over procedural language. CO 3: Understand how to model classes and relationships using UML. CO 4: Apply the concepts of OOPS like encapsulation, inheritance and polymorphism. CO 5: Handle basic file operations.
Database Systems (USCS204)	CO 1: To appreciate the importance of database design. CO 2: Analyse database requirements and determine the entities involved in the system and their

Course name	Course outcome
	relationship to one another. CO 3: Write simple queries to MySQL related to String, Maths and Date Functions. CO 4:Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands. CO 5: Understand the normalization and its role in the database design process. Handle data permissions. CO 6: Create indexes and understands the role of Indexes in optimization search.
Calculus (USCS205)	CO 1: Develop mathematical skills and enhance thinking power of learners. CO 2: Understand mathematical concepts like limit, continuity, derivative, integration of functions, partial derivatives. CO 3: Appreciate real world applications which use the learned concepts. CO 4: Skill to formulate a problem through Mathematical modelling and simulation.
Statistical Methods (USCS206)	CO 1: Calculate probability, conditional probability and independence. CO 2: Apply the given discrete and continuous distributions whenever necessary. CO 3: Define null hypothesis, alternative hypothesis, level of significance, test statistic and p value. CO 4: Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. CO 5: Apply non-parametric test whenever necessary. Conduct and interpret one-way and two-way ANOVA.
E-Commerce & Digital Marketing (USCS207)	CO 1: Understand the core concepts of E-Commerce. CO 2: Understand the various online payment techniques CO 3: Understand the core concepts of digital marketing and the role of digital marketing in business. CO 4: Apply digital marketing strategies to increase sales and growth of business CO 5: Apply digital marketing through different channels and platforms CO 6: Understand the significance of Web Analytics and Google Analytics and apply the same.
Semester III	
Course name	**Course outcome**
Principles of Operating Systems (USCS301)	CO 1: Work with any type of operating system CO 2: Handle threads, processes, process synchronization CO 3: Implement CPU scheduling algorithms CO 4: Understand the background role of memory management CO 5: Design file system.

Linear Algebra (USCS302)	CO 1: students would be able to Appreciate the relevance and applications of Linear Algebra in the field of Computer Science. CO 2: Understand the concepts through program implementation. CO 3: Install a computational thinking while learning linear algebra. CO 4: Express clear understanding of the concept of a solution to a system of equations. CO 5: Find eigenvalues and corresponding eigenvectors for a square matrix.
Data Structures (USCS303)	CO 1: Create different types of data structures. CO 2: Understand which data structure to be used based on the type of the problem. CO 3: Apply combined knowledge of algorithms and data structures to write highly effective programs in various domains.
Advanced Database Concepts (USCS304)	CO 1: Master concepts of stored procedure, functions, cursors and triggers and its use. CO 2: Learn about using PL/SQL for data management. CO 3: Use efficiently Collections and records. CO 4: Understand concepts and implementations of transaction management and crash recovery.
Java based Application Development (USCS305)	CO 1: students will able to Design basic application in java using Graphical User Interface. CO 2: The learner will be able to develop applications using swings CO 3: The learner will be able to develop web based applications using servlet and jsp CO 4: The learner will be able to connect databases with java through CO 5: The learner will be able to perform programs using JSON objects
Web Technologies (USCS306)	CO 1: students will be able to Design valid, well-formed, scalable, and meaningful pages using emerging technologies. CO 2: Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites CO 3: Develop and implement client-side and server-side scripting language programs. CO 4: Develop and implement Database Driven Websites. CO 5: Design and apply XML to create a markup language for data and document centric applications
Green Technologies (USCS3071)	CO 1: Students will be able to Explain drivers and dimensions of change for Green Technology CO 2: Appreciate Virtualization; smart meters and optimization in achieving green IT CO 3: Gain knowledge about green assets, green processes, and green enterprise architecture CO 4: ISO 14001 and related standards for Audit for Green Compliance

Semester IV	
Course name	**Course outcome**
Theory of Computation (USCS401)	CO 1: Students will be able to Understand Grammar and Languages CO 2: Learn about Automata theory and its application in Language Design CO 3: Learn about Turing Machines and Pushdown Automata CO 4: Understand Linear Bound Automata and its applications
Computer Networks (USCS402)	CO 1: Students will able to Learn basic networking concepts and layered architecture. CO 2: Understand the concepts of networking, which are important for them to be known as a 'networking professionals'.
Software Engineering (USCS403)	CO 1: Students will able to Plan a software engineering process life cycle, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements CO 2: Analyse and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology. CO 3: Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice CO 4: Able to use modern engineering tools necessary for software project management, time management and software reuse.
IoT Technologies (USCS404)	CO 1: Students will able to understand SoC and IoT CO 2: use different types of IoT Platforms and interfaces CO 3: understand and implement an idea of various types of applications built using IoT
Android Application Development (USCS405)	CO 1: Students will be able to Build useful mobile applications using Kotlin language on Android CO 2: Install and configure Android Studio for application development CO 3: Master basic to intermediate concepts of Kotlin required for mobile application development CO 4: Use built-in widgets and components, work with the database to store data CO 5: Master key Android programming concepts and deploy the application on Google Play
Advanced Application Development (USCS406)	CO 1:Students will be able to Store the data in NoSQL, document-oriented MongoDB database that brings performance and scalability. CO 2: Use Node.js and Express Framework for building fast, scalable network applications CO 3: Use AngularJS framework that offers declarative, two-way data binding for web applications. CO 4: Integrate the front-end and back-end components of the MEAN stack. CO 5: Develop robust mobile applications using Flutter.

Research Methodology (USCS4071)	CO 1: Students will be able to Define research, formulate problem and describe the research process and research methods. CO 2: Understand and apply basic research methods including research design, data analysis and interpretation. CO 3: Understand ethical issues in research, write research report, research paper and publish the paper.
Semester V	
Course name	**Course outcome**
Linux Server Administration (USCS502)	CO 1: Learner will be able to develop Linux based systems and maintain. CO 2: Learner will be able to install appropriate service on Linux server as per requirement. CO 3: Learner will have proficiency in Linux server administration.
Software Testing and Quality Assurance (USCS503)	CO 1: Understand various software testing methods and strategies. CO 2: Understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software. CO 3: Design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.
Information and Network Security (USCS504)	CO 1: Understand the principles and practices of cryptographic techniques. CO 2: Understand a variety of generic security threats and vulnerabilities, and identify & Analyse particular security problems for a given application. CO 3: Understand various protocols for network security to protect against the threats in a network
Web Services (USCS506)	CO 1: Emphasis on SOAP based web services and associated standards such as WSDL. CO 2: Design SOAP based / RESTful / WCF services CO3: Deal with Security and QoS issues of Web Services
Game Programming (USCS507)	CO 1: Learner should study Graphics and gamming concepts with present working style of developers where everything remains on internet and they need to review it, understand it, be a part of community and learn.
Semester VI	
Course name	**Course outcomes**
Wireless Sensor Networks and Mobile Communication (USCS601)	CO 1: Learner should be able to list various applications of wireless sensor networks, describe the concepts, protocols, design, implementation and use of wireless sensor networks. CO 2.: Also implement and evaluate new ideas for solving wireless sensor network design issues
Cloud Computing (USCS602)	CO 1: Learner should be able to articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing using open source technology. CO 2: Learner should be able to identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public

	cloud, private cloud, hybrid cloud, etc. They should explain the core issues of cloud computing such as security, privacy, and interoperability.
Information Retrieval (USCS604)	CO 1: Learner should get an understanding of the field of information retrieval and its relationship to search engines. CO 2: It will give the learner an understanding to apply information retrieval models.
Data Science (USCS606)	CO 1.: Learner should be able to understand & comprehend the problem; and should be able to define suitable statistical method to be adopted.
Ethical Hacking (USCS607)	CO 1: Learner will know to identify security vulnerabilities and weaknesses in the target applications. CO 2; Learner will know to test and exploit systems using various tools and understand the impact of hacking in real time machines.