# Course outcome of B.Sc. (Computer Science)

## SEM-I

| COURSE CODE | USCS101 + USCSP101 |
| --- | --- |
| COURSE NAME | Digital Systems & Architecture (Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | To learn about how computer systems work and underlying principles |
| 2 | To understand the basics of digital electronics needed for computers |
| 3 | To understand the basics of instruction set architecture for reduced and complex instruction sets |
| 4 | To understand the basics of processor structure and operation |
| 5 | To understand how data is transferred between the processor and I/O devices |
| 6 | To learn the concept of Fundamentals of Advanced Computer Architecture |

| COURSE CODE | USCS102 + USCSP102 |
| --- | --- |
| COURSE NAME | Introduction to programming in Python (Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |

| CO SR NO : | |
|---|---|
| 1 | The learner will be able to store, manipulate and access data in Python |
| 2 | The learner will be able to implement basic Input / Output operations in Python |
| 3 | The learner will be able to define the structure and components of a Python program. |
| 4 | The learner will be able to learn how to write loops and decision statements in Python. |
| 5 | The learner will be able to learn how to write functions and pass arguments in Python. |
| 6 | The learner will be able to create and use compound data types in Python |

| COURSE CODE | USCS103 + USCSP103 |
|---|---|
| COURSE NAME | LINUX Operating System(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to understand the Linux file system structure, Linux Environment |
| 2 | The learner will be able to handle shell commands for scripting, with features of regular expressions, redirections |
| 3 | The learner will be able to implement file security permissions |
| 4 | The learner will develop an understanding of working with editors vi, sed and awk for shell scripting using various control structures. |
| 5 | The learner will be able to install softwares like compilers and develop programs in C and Python programming languages on Linux Platform |
| 6 | The learner will demonstrate the ability to work with script and job scheduling commands |

| COURSE CODE | USCS104 + USCSP104 |
|---|---|
| COURSE NAME | Open Source Technologies (Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to differentiate between Open Source and Proprietary software and Licensing. |
| 2 | The learner will be able to recognize the applications, benefits and features of Open-Source Technologies |
| 3 | The learner will gain knowledge to start, manage open-source projects. |
| 4 | The learner will develop an understanding of the Open-Source Principles and Methodology |
| 5 | The learner will understand the Open-Source Ethics and Social Impact |
| 6 | The learner will develop an understanding of Open-Source Ecosystem |

| COURSE CODE | USCS105 + USCSP105 |
|---|---|
| COURSE NAME | Discrete Mathematics(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner would be able to define mathematical structures and use them to model real life situations. |
| 2 | The learner would be able to understand, construct and solve mathematical problems. |
| 3 | The learner would be able to solve puzzles based on counting problems. |

| 4 | The learner would be able to understand automata theory and corresponding formal languages. |
|---|---|
| 5 | The learner would be able to solve graph and trees problems. |
| 6 | The learner would be able to understand basic mathematical concepts which are used in software. |

| COURSE CODE | USCS106 + USCSP106 |
|---|---|
| COURSE NAME | Descriptive Statistics(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to learn to organize, manage and present data. |
| 2 | The learner will be able to analyze statistical data using measures of central tendency and dispersion. |
| 3 | The learner will be able to analyze Statistical data using basic techniques of R. |
| 4 | The learner will be able to describe the relationship between variables using techniques of correlation and regression. |
| 5 | The learner will be able to calculate and describe skewness and kurtosis as measures of non-symmetry and diverging from normality |
| 6 | The learner will be able to describe the characteristics of distribution using moments, data, effect of shift of origin and change of scale, merits and demerits. |

| COURSE CODE | USCS107 |
|---|---|
| COURSE NAME | Soft Skills |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2 |
| TYPE OF COURSE | Ability Enhancement Course |

| CO SR NO : | |
|---|---|
| 1 | The learners will be able to understand the importance and types soft skills |
| 2 | The learner will develop skills for academic and professional presentations. |
| 3 | The learner will be able to understand Leadership Qualities and Ethics. |
| 4 | The learner will understand the importance of stress management in their academic & professional life. |
| 5 | The learner will get insight into much needed technical and non-technical qualities in career planning |
| 6 | The learner will describe the importance of leadership, team building, decision making and the need to remove stress in their day to day life |

**SEM-II**

| COURSE CODE | USCS201 +USCSP201 |
|---|---|
| COURSE NAME | Design & Analysis of Algorithms (Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used. |
| 2 | The learner will be able to appreciate the use of various data structures as per need |
| 3 | The learner will have an understanding of selecting, deciding and applying appropriate design principles by understanding the requirements of any real life problems. |
| 4 | The learner will be familiarized with fundamental problem-solving strategies like searching, sorting, selection, recursion and help them to evaluate efficiencies of various algorithms. |
| 5 | The learner will understand the basic principles of algorithm design |
| 6 | The learner will apply design and development principles in the construction of software systems of varying complexity |

| COURSE CODE | USCS202 + USCSP202 |
|---|---|
| COURSE NAME | Advanced Python Programming(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to implement OOP concepts in Python including Inheritance and Polymorphism |
| 2 | The learner will develop an understanding to work with files and perform operations on it using Python. |
| 3 | The learner will be able to implement regular expression and concept of threads for developing efficient program |
| 4 | The learner will develop an understanding to implement exception handling in Python applications for error handling. |
| 5 | The learner will develop an understanding of working with databases. |
| 6 | The learner will be able to design GUI in Python and implement networking in Python |

| COURSE CODE | USCS203 + USCSP203 |
|---|---|
| COURSE NAME | Introduction to OOPs using C++(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will develop an understanding of working with numeric, character and textual data and arrays. |
| 2 | The learner will understand the importance of OOP approach over procedural language. |
| 3 | The learner will develop an understanding of model classes and relationships using UML. |

| 4 | The learner will apply the concepts of OOPS like encapsulation, inheritance and polymorphism. |
|---|---|
| 5 | The learner will be able to handle basic file operations. |
| 6 | The learner will able to handle different types of coding |

| COURSE CODE | USCS204 + USCSP204 |
|---|---|
| COURSE NAME | Database Systems(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will develop an appreciation for the importance of database design. |
| 2 | The learner will be to analyze database requirements and determine the entities involved in the system and their relationship to one another. |
| 3 | The learner will be able to write simple queries to MySQL related to String, Maths and Date Functions. |
| 4 | The learner will develop the ability to create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands. |
| 5 | The learner will understand the normalization and its role in the database design process. |
| 6 | The learner will handle data permissions, create indexes and understand the role of Indexes in optimization search. |

| COURSE CODE | USCS205 + USCSP205 |
|---|---|
| COURSE NAME | Calculus (Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner would be able to develop their mathematical skills. |

| 2 | The learner would be able to understand mathematical concepts like limit, continuity and differentiability of functions. |
|---|---|
| 3 | The learner would be able to analyse the concept of integration. |
| 4 | The learner would be able to formulate a problem through Mathematical modeling and simulation. |
| 5 | The learner would be able to understand the concepts of partial differential equations and their solutions. |
| 6 | The learner would be able to understand the application of partial derivatives in Science. |

| COURSE CODE | USCS206 + USCSP206 |
|---|---|
| COURSE NAME | Statistical Methods(Theory and Practical) |
| LEVEL OF COURSE | BASIC |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be aware about basic probability axioms and rules and its application. |
| 2 | The learner will develop an understanding of the concept of conditional probability and Independence of events. |
| 3 | The learner will develop familiarity with discrete and continuous random variables as well as standard discrete and continuous distributions. |
| 4 | The learner will develop an understanding of critical thinking in the theory of probability and its applications in real life problems. |
| 5 | The learner will develop computational skills to implement various statistical inferential approaches. |
| 6 | The learner will be able to understand group and within group variability and the purpose of conducting analytical comparisons. |

| COURSE CODE | USCS207 |
|---|---|
| COURSE NAME | E-Commerce & Digital Marketing |
| LEVEL OF COURSE | BASIC |

| COURSE CREDIT | 2 |
|---|---|
| TYPE OF COURSE | Ability Enhancement Course |
| CO SR NO : | |
| 1 | The learner develops an understanding of the core concepts of E-Commerce. |
| 2 | The learner will develop an understanding of the various online payment techniques. |
| 3 | The learner will understand the core concepts of digital marketing and the role of digital marketing in business. |
| 4 | The learner will apply digital marketing strategies to increase sales and growth of business. |
| 5 | The learner will apply digital marketing through different channels and platforms. |
| 6 | The learner will develop an understanding of the significance of Web Analytics and Google Analytics and apply the same. |

## SEM-III

| COURSE CODE | USCS301 + USCSP301 |
|---|---|
| COURSE NAME | Principles of Operating Systems (Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner would be able to work with any type of operating system. |
| 2 | The learner would be able to handle threads, processes, process synchronization. |
| 3 | The learner would be able to implement CPU scheduling algorithms. |
| 4 | The learner will develop an understanding of the background role of memory management. |
| 5 | The learner will be able to design a file system. |
| 6 | The learner would be able to apply segmentation and paging techniques. |

| COURSE CODE | USCS302 + USCSP302 |
|---|---|
| COURSE NAME | Linear Algebra(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner would be able to understand extended real number system and its uses in software program -electrical circuits. |
| 2 | The learner would be able to describe different sets having mathematical laws. |
| 3 | The learner would be able to identify the characteristics of functions. |
| 4 | The learner would be able to solve systems of linear equations through different methods. |
| 5 | The learner would be able to understand patterns of salesmen through the Markov chain . |
| 6 | The learner would be able to analyse the mechanism of Google page ranking system. |

| COURSE CODE | USCS303 + USCSP303 |
|---|---|
| COURSE NAME | Data Structures (Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to describe different types of data structures. |
| 2 | The learner will develop the ability to program data structures and use them in implementations of abstract data types. |
| 3 | The learner will be able to explain the structure and working of Linked List data structure. |
| 4 | The learner will be able to compare stack and queue, which are the base of data structure. |

| 5 | The learner will be able to discuss different sorting and searching data techniques and Tree data structure. |
|---|---|
| 6 | The learner will be able to recognize hashing technique and Graph data structure. |

| COURSE CODE | USCS304 + USCSP304 |
|---|---|
| COURSE NAME | Advanced Database Concepts(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will be able to recognize hashing technique and Graph data structure. |
| 2 | The learner will be able to develop an understanding of master concepts of stored procedure, functions, cursors and triggers and its use. |
| 3 | The learner will gain knowledge about using PL/SQL for data management. |
| 4 | The learner will be able to use collections and records efficiently. |
| 5 | The learner will develop an understanding of the concepts and implementations of transaction management and crash recovery. |
| 6 | The learner will be able to understand the concept of trigger. |

| COURSE CODE | USCS305 + USCSP305 |
|---|---|
| COURSE NAME | Java based Application Development(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Skill Enhancement Course (SEC) |
| CO SR NO : | |
| 1 | The learner will be able to design basic applications in Java using Graphical User Interface. |
| 2 | The learner will be able to develop applications using swings |
| 3 | The learner will be able to develop web based applications using servlet and jsp |
| 4 | The learner will be able to connect databases with Java |
| 5 | The learner will be able to perform programs using JSON objects |
| 6 | The learner will be able to implement different OOPs concepts. |

| COURSE CODE | USCS306 |
|---|---|
| COURSE NAME | Web Technologies(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Skill Enhancement Course (SEC) |
| CO SR NO : | |
| 1 | The learner will develop an understanding of basic concepts of the Internet and World Wide Web. |
| 2 | The learner will be able to comprehend different HTML elements that can be used to develop static web pages. |
| 3 | The learner will become familiar with the concept of stylesheets and various CSS effects. |
| 4 | The learner will be able to design valid, well-formed, scalable, and meaningful pages using emerging technologies. |

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|---|---|
| 5 | The learner will understand the various platforms, devices, display resolutions, viewports, and browsers that render websites |
| 6 | The learner will develop and implement client-side and server-side scripting language programs. |

| COURSE CODE | USCS3072 |
|---|---|
| COURSE NAME | Green Technologies |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Generic Elective |
| CO SR NO : | |
| 1 | The learner will gain knowledge about Green IT Fundamentals, Business IT, and the Environment |
| 2 | The learner will develop an understanding of Green IT Strategies and the significance of Green IT strategies. |
| 3 | The learner will understand Green Enterprise Architecture and Green Information Systems. |
| 4 | The learner will be able to estimate the carbon credits of various activities |
| 5 | The learner will apply the initiatives for green IT in hardware, software, network communication and data centre operations |
| 6 | The learner will develop an understanding of sociocultural aspects of Green IT and Green Compliance. |

**SEM-IV**

| COURSE CODE | USCS401 |
|---|---|
| COURSE NAME | Theory of Computation(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will develop an understanding of Grammar and Languages used in IT. |
| 2 | The learner will understand Automata theory and its application in Language Design. |
| 3 | The learner will develop an understanding about context free language. |
| 4 | The learner will understand the working of Turing Machines and Pushdown Automata |
| 5 | The learner will understand about Linear Bounded Automata and its applications |
| 6 | The learner will gain knowledge about undecidability. |

| COURSE CODE | USCS402 |
|---|---|
| COURSE NAME | Computer Networks(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will understand Basic Concepts of Networking. |

| 2 | The learner will understand Working of Network Layer Architecture. |
|---|---|
| 3 | The learner develops an understanding of practical implementation of Basic Routing Algorithms. |
| 4 | The learner will be able to describe different Networking Protocols. |
| 5 | The learner will gain knowledge of the basic networking concepts and layered architecture. |
| 6 | The learner will develop an understanding of the concepts of networking, which are important for them to be known as 'networking professionals'. |

| COURSE CODE | USCS403 |
|---|---|
| COURSE NAME | Software Engineering (Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner would be 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 |
| 2 | The learner would be able to analyze and translate a specification into a design, using an appropriate software engineering methodology. |
| 3 | The learner would be able to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice. |
| 4 | The learner would be able to use modern engineering tools necessary for software project management, time management and software reuse. |
| 5 | The learner will understand the concept of Software Engineering. |
| 6 | The learner will understand design & testing principles of software project development. |

| COURSE CODE | USCS404 |
| --- | --- |
| COURSE NAME | IoT Technologies(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will understand SoC and IoT |
| 2 | The learner will develop an understanding of different types of IoT Platforms and interfaces |
| 3 | The learner will understand the idea of various types of applications built using IoT |
| 4 | The learner will understand practical applications of IoT in the real life world. |
| 5 | The learner will be able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks |
| 6 | The learner will be able to understand the building blocks of the Internet of things and characteristics. |

| COURSE CODE | USCS405 |
| --- | --- |
| COURSE NAME | Android Application Development (Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Core Subject |
| CO SR NO : | |
| 1 | The learner will have an understanding of the Kotlin Programming Language for application development |
| 2 | The learner will be able to create robust mobile applications on simulators and physical devices. |
| 3 | The learner will have the opportunity of creating intuitive, reliable mobile apps using the android services and components. |

| 4 | The learner will develop an understanding of handling data local and remote data storage |
|---|---|
| 5 | The learner will be able to create a seamless user interface that works with different mobile screens |
| 6 | The learner will develop an understanding to use built-in widgets and components. |

| COURSE CODE | USCS406 |
|---|---|
| COURSE NAME | Advanced Application Development(Theory and Practical) |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2+1 |
| TYPE OF COURSE | Skill Enhancement Course (SEC) |
| CO SR NO : | |
| 1 | Understand basic Node .js concept. |
| 2 | Store the data in NoSQL, document-oriented MongoDB database that brings performance and scalability. |
| 3 | Use Node.js and Express Framework for building fast, scalable network applications |
| 4 | Use AngularJS framework that offers declarative, two-way data binding for web applications. |
| 5 | Integrate the front-end and back-end components of the MEAN stack. |
| 6 | Develop robust mobile applications using Flutter. |

| COURSE CODE | USCS4071 |
|---|---|
| COURSE NAME | Research Methodology |
| LEVEL OF COURSE | MIDDLE |
| COURSE CREDIT | 2 |
| TYPE OF COURSE | Generic Elective |
| CO SR NO : | |

| 1 | The learners are able to define research and formulate problem. |
|---|---|
| 2 | The learners are able to describe the research process and research methods. |
| 3 | The learners are able to understand basic research methods including research design, data analysis and interpretation |
| 4 | The learners are able to understand ethical issues in research. |
| 5 | The learners are able to write research report, research paper. |
| 6 | The learners are able to identify research topics and can publish their own research papers. |

## SEM V

| COURSE CODE | USCS501 |
|---|---|
| COURSE NAME | Artificial Intelligence |
| LEVEL OF COURSE | Advance |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | ELECTIVE -I |
| CO SR NO : | |
| 1 | To understand the concepts of Artificial Intelligence |
| 2 | Categorize an Artificial Intelligence problem based on its characteristics and its constraints. |
| 3 | Understand and implement search and adversarial (game) algorithms. |
| 4 | Learn different logic formalisms and decision taking in planning problems. |
| 5 | Learn how to analyze the complexity of a given problem and come with suitable optimizations. |
| 6 | Demonstrate practical experience by implementing and experimenting with the learnt algorithms. |

| COURSE CODE | USCS503 |
|---|---|
| COURSE NAME | Software Testing and Quality Assurance |

| LEVEL OF COURSE | Advance |
|---|---|
| COURSE CREDIT | 3 |
| TYPE OF COURSE | ELECTIVE -I |
| CO SR NO : | |
| 1 | learners will understand various software testing methods and strategies. |
| 2 | The learners will be familiar with the process of verification and validation. |
| 3 | learners will understand a variety of software metrics. |
| 4 | learners will be able to identify defects and managing those defects for improvement in quality for given software. |
| 5 | The learners will design SQA activities, formal technical review report for software quality control and assurance. |
| 6 | The learners will design SQA strategy for software quality control and assurance. |


| COURSE CODE | USCS504 |
|---|---|
| COURSE NAME | Information and Network Security |
| LEVEL OF COURSE | Advance |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | ELECTIVE -II |
| CO SR NO : | |
| 1 | Define the security controls sufficient to provide a required level of confidentiality, integrity, and availability in an organization's computer systems and networks. |
| 2 | To understand various protocols for network security and substitution technique and Transposition technique, to protect against the threats in the networks |
| 3 | Understand key management and distribution schemes and design User Authentication |
| 4 | Analyze and design hash and MAC algorithms, and digital signatures. |
| 5 | Know about Intruders and Intruder Detection mechanisms, Types of Malicious software, |
| 6 | Firewall Characteristics, Types of Firewalls, Firewall Location and Configurations |

| COURSE CODE | USCS506 |
| --- | --- |
| COURSE NAME | Web Services |
| LEVEL OF COURSE | Advance |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | ELECTIVE -II |
| CO SR NO : | |
| 1 | learner will understand Web services basics |
| 2 | learner will emphasis on SOAP based web services and associated standards such as WSDL. |
| 3 | learner will learn how to implement and deploy web service client and server. |
| 4 | learner will be able to design RESTful services |
| 5 | learner will design WCF services |
| 6 | learner will understand secure web services and QoS of Web Services |

| COURSE CODE | USCS507 |
| --- | --- |
| COURSE NAME | Game Programming |
| LEVEL OF COURSE | Advance |
| COURSE CREDIT | 2 |
| TYPE OF COURSE | Skill Enhancement |
| CO SR NO : | |
| 1 | Learners will be able to use different mathematical concepts such as cartesian coordinates,vectors in game programming |
| 2 | learners will be able to perform and describe positions and orientation of shapes under single transformations including rotations , translations, reflections on and off the coordinate plane. |

| 3 | learners will able to use the different directx api for game programming. |
|---|---|
| 4 | learners will be able to apply different mathematical concept such as trignometry,curves and analytical geometry in game programming. |
| 5 | learners will be able to differentiate between ar,vr and xr. |
| 6 | learner will get familiar with unity 3d software. |

## SEM VI

| COURSE CODE | USCS602 |
|---|---|
| COURSE NAME | **Cloud Computing** |
| LEVEL OF COURSE | **Advance** |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | Elective-I |
| CO SR NO : | |
| 1 | To learn the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing. |
| 2 | Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic and cost-efficient. |
| 3 | Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model. |
| 4 | Describe the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technologies |
| 5 | Implement different types of Virtualization technologies and Service Oriented Architecture systems |
| 6 | Choose among various cloud technologies for implementing applications |

| COURSE CODE | USCS603 |
|---|---|
| **COURSE NAME** | Cyber Forensics |
| **LEVEL OF COURSE** | **Advance** |
| **COURSE CREDIT** | 3 |
| **TYPE OF COURSE** | Elective-I |
| **CO SR NO :** | |
| **1** | Create a method for gathering, assessing and applying new and existing legislation and industry trends specific to the practice of digital forensics. |
| **2** | Able to analyse the role of digital forensics in the field of information assurance and cyber security and recognize the opportunities to benefit from and support the goals of those fields. |
| **3** | The learner will be able to plan and prepare for all stages of an investigation - detection, initial response and management interaction |
| **4** | learners will able to investigate various media to collect evidence |
| **5** | Evaluate the effectiveness of available digital forensics tools and use them in a way that optimizes the efficiency and quality of digital forensics investigations. |
| **6** | learner can report findings in a way that would be acceptable in the court of law. |

| COURSE CODE | USCS604 |
|---|---|
| **COURSE NAME** | Information Retrieval |
| **LEVEL OF COURSE** | **Advance** |
| **COURSE CREDIT** | 3 |
| **TYPE OF COURSE** | Elective - II |
| **CO SR NO :** | |
| **1** | learner should get an understanding of the field of information retrieval and its relationship to search engines. |
| **2** | It will give the learner an understanding to apply information retrieval models. |

| 3 | Understand query, document and phrase translation |
|---|---|
| 4 | Design the method to build inverted index. |
| 5 | Illustrate how N-grams are used for detection and correction of spelling errors. |
| 6 | Illustrate algorithms used for natural language processing |

| COURSE CODE | USCS606 |
|---|---|
| COURSE NAME | Data Science |
| LEVEL OF COURSE | **Advance** |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | Elective-II |
| CO SR NO : | |
| 1 | Understanding basic data science concepts. |
| 2 | Develop conditional and iterative statements to write c programs |
| 3 | Learning to detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization. |
| 4 | Illustrate the flowchart and design an algorithm for a given problem to develop a c programs using operators. |
| 5 | Exercise user defined functions to solve real time problems. |
| 6 | Making aware of how to address advanced statistical situations, Modeling and Machine Learning. |

| COURSE CODE | USCS607 |
|---|---|
| COURSE NAME | Ethical Hacking |
| LEVEL OF COURSE | **Advance** |
| COURSE CREDIT | 3 |
| TYPE OF COURSE | Skill Enhancement |

| CO SR NO : | |
|---|---|
| **1** | Learner will know to identify security vulnerabilities and weaknesses in the target applications. |
| **2** | learners will also know to test and exploit systems using various tools |
| **3** | Understand the impact of hacking in real time machines |
| **4** | Understand the ethics, legality, methodologies and techniques of hacking. |
| **5** | learners will understand Types of attacks and their common prevention mechanisms |
| **6** | learners will understand additional Security Mechanisms |