DNYANDEEP SHIKSHAN PRASARAK MANDAL, KHED (RATNAGIRI'S)

# DNYANDEEP COLLEGE OF SCIENCE AND COMMERCE

**Revised from 2021-2022 & 2022-23**

# COURSE OUTCOME (CO)

## BSc Computer Science

# DEPARTMENT OF COMPUTER SCIENCE

## SEMESTER I

**Course (Paper) Name and No.: Digital Systems & Architecture (USCS101)**

CO1 To have an understanding of Digital systems and operation of a digital computer.
CO2 To learn different architectures & organizations of memory systems, processor organization and control unit.
CO3 To understand the working principles of multiprocessor and parallel organization's as advanced computer architectures.

**Course (Paper) Name and No.: Introduction to Programming with Python (USCS102)**

CO1 To learn how to design and program Python applications.
CO2 To explore the innards of Python Programming and understand components of Python Program.
CO3 To define the structure and components of a Python program.
CO4 To learn how to write loops and decision statements in Python

**Course (Paper) Name and No.: LINUX Operating System (USCS103)**

CO1 To learn basic concepts of Linux in terms of operating system
CO2 To learn use of various shell commands with regular expressions
CO3 To set Linux Environment variables and learn setting file permissions to maintain Linux security implementation
CO4 To learn installation of compilers and programming using C and Python languages of Linux platform.

**Course (Paper) Name and No.: Open Source Technologies (USCS104)**

CO1 Understand the difference between open-source software and commercial software.
CO2 Understand the policies, licensing procedures and ethics of FOSS.
CO3 Understand open-source philosophy, methodology and ecosystem.
C04 Awareness with Open-Source Technologies.

## Course (Paper) Name and No.: Discrete Mathematics (USCS105)

CO1 The purpose of the course is to familiarize the prospective learners with mathematical structures that are fundamentally discrete.
CO2 This course will enhance prospective learners to reason and ability to articulate mathematical problems
CO3 This course will introduce functions, forming and solving recurrence relations and different counting principles.
CO4 These concepts will be useful to study or describe objects or problems in computer algorithms and programming languages and these concepts can be used effectively in other courses.

## Course (Paper) Name and No.: Descriptive Statistics (USCS106)

CO1 To develop the learners ability to deal with different types of data.
CO2 To enable the use of different measures of central tendency and dispersion wherever relevant.
CO3 To make learner aware about the techniques to check the Skewness and Kurtosis of data.
CO4 To make learner enable to find the correlation between different variables and further apply the regression analysis to find the exact relation between them.

## Course (Paper) Name and No.: Soft Skills (USCS107)

CO1 Understand the significance and essence of a wide range of soft skills
CO2 Learn how to apply soft skills in a wide range of routine social and professional settings.
CO3 Learn how to employ soft skills to improve interpersonal relationships.
CO4 Learn how to employ soft skills to enhance employability and ensure workplace and career success

## SEMESTER II

**Course (Paper) Name and No.: Design & Analysis of Algorithms (USCS201)**

CO1 To make students understand the basic principles of algorithm design.

CO2 To give idea to students about the theoretical background of the basic data structures.

CO3 To familiarize the students with fundamental problem-solving strategies like searching, sorting, selection, recursion and help them to evaluate efficiencies of various algorithms.

CO4 To teach students the important algorithm design paradigms and how they can be used to solve various real world problems.

**Course (Paper) Name and No.: Advanced Python Programming (USCS202)**

CO1 To learn how to design object-oriented programs with Python classes.

CO2 To learn about reading, writing and implementing other operation on files in Python.

CO3 To implement threading concept and multithreading on Python.

CO4 To design GUI Programs and implement database interaction using Python.

**Course (Paper) Name and No.: Introduction to OOPs using C++ (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.

CO4 Apply the concepts of OOPS like encapsulation, inheritance and polymorphism.

**Course (Paper) Name and No.: Database Systems (USCS204)**

CO1 To make students aware fundamentals of database system.

CO2 To give idea how ERD components helpful in database design and implementation.

CO3 To experience the students working with database usingMySQL.

CO4 To familiarize the student with normalization, database protection anddifferent DCL Statements.

**Course (Paper) Name and No.: Calculus (USCS205)**

CO1 The primary objective of this course is to introduce the basic tools of

Calculus which are helpful in understanding their applications to the real world problems.

CO2 The course is designed to have a grasp of important concepts of Calculus in a scientific way.

CO3 It covers topics from as basic as definition of functions to partial derivatives of functions in a gradual and logical way.

CO4 The learner is expected to solve as many examples as possible to a get compete clarity and understanding of the topics covered.

**Course (Paper) Name and No.: Statistical Methods (USCS206)**

CO1 To make learner aware about basic probability axioms and rules and its application.

CO2 To understand the concept of conditional probability and Independence of events.

CO3 To make learner familiar with discrete and continuous random variables as well asstandard discrete and continuous distributions.

CO4 To learn computational skills to implement various statistical inferential approaches.

**Course (Paper) Name and No.: E-Commerce & Digital Marketing (USCS207)**

CO1 To understand increasing significance of E-Commerce and its applications in Business and Various Sectors.

CO2 To provide an insight on Digital Marketing activities on various Social Media platforms and its emerging significance in Business.

CO3 To understand Latest Trends and Practices in E-Commerce and Digital Marketing, along with its Challenges and Opportunities for an Organization

## SEMESTER III

**Course (Paper) Name and No.: Principles of Operating Systems (USCS301)**

CO1 To learn basic concepts and structure of operating systems.
CO2 To learn about process and synchronization in operating system level.
CO3 To learn CPU scheduling algorithms.
CO4 To learn Memory and File system management.

**Course (Paper) Name and No.: Linear Algebra (USCS302)**

CO1 To offer the learner the relevant Linear Algebra concepts through Computer Science applications.
CO2 To interpret existence and analyze the solution set of a system of linear equations.
CO3 To formulate, solve, apply, and interpret properties of linear systems.
CO4 To learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.

**Course (Paper) Name and No.: Data Structures (USCS303)**

CO1 To introduce data abstraction and data representation in memory.
CO2 To describe, design and use of elementary data structures such as stack, queue, linked list, tree and graph.
CO3 How and why different data structures are used for different types of problems.

**Course (Paper) Name and No.: Advanced Database Concepts (USCS304)**

CO1 To develop understanding of concepts and techniques for data management and learn about widely used systems for implementation and usage.
CO2 To develop understanding of Transaction management and crash recovery.
CO3 To develop concepts of programming concepts of database.

**Course (Paper) Name and No.: Java based Application Development (USCS305)**

CO1 To provide insight into java based applications using OOP concepts.
CO2 To provide understanding of developing GUI based desktop applications in java.
CO3 To provide knowledge of web based applications through servlet and jsp.
CO4 To provide understanding and implementation of basic JSON.

**Course (Paper) Name and No.: Web Technologies (USCS306)**

CO1 To understand the concepts of Hyper Text Markup Language and Cascading Style Sheets.
CO2 To learn JavaScript for creating dynamic websites.
CO3 To learn various operations performed on data among web applications using XML.
CO4 To learn Server-Side Programming using PHP

**Course (Paper) Name and No.: Green Technologies (USCS307)**

CO1 Know about Green IT Fundamentals: Business, IT, and the Environment.
CO2 Green IT Strategies and Significance of Green IT Strategies.
CO3 Green Enterprise Architecture and Green Information Systems.
CO4 Sociocultural Aspects of Green IT and Green Compliance.

## SEMESTER IV

**Course (Paper) Name and No.: Theory of Computation (USCS401)**

CO1 To give an overview of the theoretical foundations of computer science from the perspective of formal languages
CO2 To illustrate finite state machines to solve problems in computing.
CO3 To explain the hierarchy of problems arising in the computer sciences. CO4 To familiarize Regular grammars, context frees grammar.

**Course (Paper) Name and No.: Computer Networks (USCS402)**

CO1 To Understand Basic Concepts of Networking.
CO2 To Understand Working of Network Layer Architecture.
CO3 To Learn Practical Implementation of Basic Routing Algorithms.
CO4 To Learn Different Networking Protocols.

**Course (Paper) Name and No.: Software Engineering (USCS403)**

CO1 To learn and understand the Concepts of Software Engineering
CO2 To learn and understand Software Development Life Cycle
CO3 To apply the project management and analysis principles to software project development.
CO4 To apply the design & testing principles to software project development.

**Course (Paper) Name and No.: IoT Technologies (USCS404)**

CO1 Introduce concepts of SoC and IoT.
CO2 Introduce various types of IoT platforms.
CO3 Interfacing various types of devices using different protocols with IoT.
CO4 Understand practical applications of IoT in real life world.

**Course (Paper) Name and No.: Android Application Development (USCS405)**

CO1 Kotlin Programming Language for application development.
CO2 Creating robust mobile applications on simulators and physical devices.
CO3 Creating intuitive, reliable mobile apps using the android services and components.
CO4 Handling data local and remote data storage.
CO5 Create a seamless user interface that works with different mobile screens.

**Course (Paper) Name and No.: Advanced Application Development (USCS406)**

CO1 To understand all the necessary and important technologies such as MongoDB, Express.js, AngularJS, and Node.js.

CO2 To understand modern app development using Flutter.

**Course (Paper) Name and No.: Management & Entrepreneurship (USCS407)**

CO1 To understand the idea of management, process and its levels.
CO2 To understand the perception of entrepreneurship, process and its types.
CO3 To understand the concept SSI and steps to start SSI.
CO4 To understand the selection of project, project report, project appraisal, And its feasibility.

# SEMESTER V

**Course (Paper) Name and No.: Linux Server Administration (USCS502)**

CO1 Learner will be able to develop Linux based systems and maintain.
CO2 Learner will be able to install appropriate service on Linux server as per requirement.
CO3 Learner will have proficiency in Linux server administration.

**Course (Paper) Name and No.: Software Testing and Quality Assurance (USCS503)**

CO1 Learner Understand various software testing methods and strategies.
CO2 Learner Understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
CO3 Learner able to Design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.

**Course (Paper) Name and No.: Information and Network Security (USCS504)**

CO1 Understand the principals & practices of cryptographic techniques
CO2 Understand a variety of generic security threats & vulnerabilities & Identify & analyze particular security problems for a given application.
CO3 Understand various protocols for network security to protect against the threats in a network.

**Course (Paper) Name and No.: Web Services (USCS506)**

CO1 Emphasis on SOAP based web services and associated standards such as WSDL.
CO2 Design SOAP based / RESTful services Deal with Security and QoS issues of Web Services.
CO3 WCF services Deal with Security and QoS issues of Web Services.
CO4 Learning Web Services Development Life Cycle.
CO5 Learning JSON message format and tools and frameworks around JSON

**Course (Paper) Name and No.: Game Programming (USCS507)**

CO1 Learner should get the understanding computer Graphics programming using

Directx or Opengl.

CO2 Analyze Learner should study Graphics and gamming concepts with present working style of developers .

CO3 Understanding various Introduction to Rendering Engines

## SEMESTER VI

**Course (Paper) Name and No.: Wireless Sensor Networks and Mobile Communication (USCS601)**

CO1 Learner should be able to list various applications of wireless sensor networks .

CO2 Learner should be able to describe the concepts, protocols, design, implementation and use of wireless sensor networks .

CO3 Learner should be implement and evaluate new ideas for solving wireless sensor network design issues.

**Course (Paper) Name and No.: Cloud Computing (USCS602)**

CO1 To learn 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.

CO2 Learner should be able to identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.

CO3 Learner should explain the core issues of cloud computing such as security, privacy, and interoperability.

CO4 Familiar with open source cloud computing software, and free/commercial cloud services.

CO5 Learn the architecture, deployment models, and infrastructure models of Cloud Computing.

**Course (Paper) Name and No.: Information Retrieval (USCS604)**

CO1 To understand the field of Information retrieval.

CO2 Understand to design information retrieval model.

CO3 Understand the concepts of Evaluation system.

**Course (Paper) Name and No.: Digital Image Processing (USCS605)**

CO1 Learners should review the fundamental concepts of a digital image processing System.

CO2 Analyze the image in frequency domain using various transforms

CO3 Evaluate the technique for image enhancement and image segmentation.
CO4 Various compression techniques
CO5 They will be familiar with basic image processing techniques for solving real Problems.

**Course (Paper) Name and No.: Ethical Hacking (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.

## Programme Learning Outcomes

At the end of three year Bachelor of Computer Science the students will be able:

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