

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

Re-accredited by NAAC with 'A+' Grade (4th Cycle)

College of Excellence (UGC)

Coimbatore – 641 029

DEPARTMENT OF COMPUTER SCIENCE

COURSE OUTCOMES (CO)

B.SC. COMPUTER SCIENCE

**For the students admitted in the
Academic Year 2020-2021**

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS101		Core Paper 1 – COBOL Programming		
Batch 2020-2021	Semester I	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To make use of COBOL programming in business, finance, and administrative systems.
2. To identify the four divisions of COBOL program and describe their purpose.
3. To construct conditions to execute procedures within a COBOL program.
4. To recognize similarities and common characteristics of two or more programming languages.

Course Outcomes (CO)

K1 to K4	CO1	Understand the syntax and semantics of the COBOL language
	CO2	Recognize how to develop and implement a program in the COBOL language
	CO3	Develop various forms of data representation and structures supported by the COBOL language
	CO4	Appreciate the appropriate applications (typically business) of the COBOL language

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCSICL		Title: Core Practical 1 – COBOL Programming - Lab		
Batch 2020-2021	Semester I	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To expose different features of COBOL language and implement them.
2. To learn the fundamental concepts of four Divisions.
3. To understand Input and Output Statements.
4. To develop programs relevant to business applications.

Course Outcomes (CO)

K1 to K4	CO1	Study the logical structure of a computer program and to develop programs in COBOL language.
	CO2	Understand Control structures.
	CO3	Learn how to compile, debug, link and executing COBOL programs.
	CO4	Demonstrate practical applications of programs developed in COBOL.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS202		Core Paper 2 – C Programming		
Batch 2020-2021	Semester II	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To develop an in-depth understanding of functional and logical concepts of C Programming.
3. To provide exposure to problem-solving through C programming.
4. To familiarize the basic syntax and semantics of C Language

Course Outcomes (CO)

K1 to K4	CO1	Recollect various programming constructs and to develop C programs.
	CO2	Understand the fundamentals of C programming.
	CO3	Choose the right data representation formats based on the requirements of the problem.
	CO4	Implement different Operations on arrays, functions, pointers, structures, unions and files.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS2CM		Core Practical 2 – C Programming – Lab		
Batch 2020-2021	Semester II	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To introduce the field of programming using C language.
2. To enhance the analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes (CO)

K1 to K4	CO1	Develop programming skills using the fundamentals and basics of C Language.
	CO2	Develop programs using the basic elements like control statements, Arrays and Strings
	CO3	Enable effective usage of arrays, structures, functions and pointers.
	CO4	Implement files and command line arguments.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS303		Core Paper 3 – Data Structures		
Batch 2020-2021	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To educate the concepts of fundamentals of writing algorithms and approach in problem solving.
2. To represent the basic concepts of stack, queue, linked list, trees and graphs.
3. To understand the concepts of searching and sorting techniques.

Course Outcomes (CO)

K1 to K4	CO1	Remember the concepts of algorithms for searching, sorting and dynamic programming.
	CO2	Understand the representations of data and various algorithm
	CO3	Apply appropriate algorithms and data structures for real time applications.
	CO4	Analyze the complexity of different algorithms

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS304		Core Paper 4 – Operating Systems		
Batch 2020-2021	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. Students will gain knowledge of basic operating system concepts.
2. To have an in-depth understanding of process concepts, deadlock and memory management.
3. To provide an exposure to scheduling algorithms, devices and information management.
4. Students will familiarize on the general structure of an operating system and case study is also provided.

Course Outcomes (CO)

K1 to K4	CO1	Remember the basic concepts of operating system.
	CO2	Understand the concepts like interrupts, deadlock , memory management and file management.
	CO3	Analyze the need for scheduling algorithms.
	CO4	Implement different algorithms used for representation, scheduling, allocation in DOS and UNIX operating system.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS305		Core Paper 5 – Object Oriented Programming with C++		
Batch 2020-2021	Semester III	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To develop a greater understanding of the issues involved in programming language design and object oriented paradigms and its implementation.
2. To impart adequate knowledge on the need of object oriented programming languages.
3. To enhance problem solving and programming skills in C++ by implementing the object oriented concepts.

Course Outcomes (CO)

K1 to K4	CO1	Remember the characteristics of Procedure and Object Oriented Programming Languages
	CO2	Understand the fundamentals of C++ programming structure, function overloading and constructors.
	CO3	To be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
	CO4	Apply the concepts in object oriented programming in terms of software reuse and managing complexity to solve real-world problems.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS3CN		Core Practical 3 – Object Oriented Programming with C++ - Lab		
Batch 2020-2021	Semester III	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To familiarize the students with language environment and to develop the programs for solving the problems using function overloading, constructors and object.
2. This course provides methods and technologies involved in building complex software. It also introduces concepts that includes various steps involved in developing software including requirement elicitation, system design, object design and testing.

Course Outcomes (CO)

K1 to K4	CO1	Implement the concepts of object oriented programming.
	CO2	Apply string functions to perform operator overloading,
	CO3	Demonstrate virtual functions and inheritance.
	CO4	Implement files and command line arguments.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS406		Core Paper 6 – Database Management System		
Batch 2020-2021	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To grasp the different issues involved in the design of a database system.
2. To study the physical and logical database designs and database modeling like relational, hierarchical, and network models.
3. To understand essential DBMS concepts such as: database security, integrity and normalization.
4. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling and designing a DBMS.

Course Outcomes (CO)

K1 to K4	CO1	Define data independence, data models for database systems, database schema and database instances.
	CO2	Understand and use data manipulation language to query and manage a database.
	CO3	Analyze and design a real database application.
	CO4	Apply normalization concepts for designing a good database with integrity constraints.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS407		Core Paper 7 – Software Engineering and Testing		
Batch 2020-2021	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To enhance the basic software engineering methods and practices.
2. To learn the techniques for developing software systems.
3. To understand the object oriented design.
4. To understand software testing approaches.

Course Outcomes (CO)

K1 to K4	CO1	Understand the basic concepts of software engineering
	CO2	Apply the software engineering models in developing software applications.
	CO3	Implement the object oriented design in various projects
	CO4	Analyze the various software testing approaches

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS408		Core Paper 8 – Visual Basic and Oracle		
Batch 2020-2021	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objective

1. The main aim of the course is to cover visual basic and oracle programming skills required for modern software development.
2. To study the advantages of Controls available with visual basic.
3. To gain a *basic* understanding of database access and management using data controls.
4. To facilitate the learner to carry out project works using the tools available in VB and Oracle.

Course Outcomes (CO)

K1 to K4	CO1	Demonstrate fundamental skills in utilizing the tools of a visual environment such as command, menus and toolbars.
	CO2	Implement SDI and MDI applications using forms, dialogs, and other types of GUI components.
	CO3	Understand the connectivity between VB with MS-ACCESS, ORACLE and SQL and SQL database
	CO4	Implement the methods and techniques to develop projects.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS4CO		Core Practical 4 – Visual Basic and Oracle - Lab		
Batch 2020-2021	Semester IV	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To develop applications using Graphical User Interface tools.
2. To understand the design concepts.
3. To design and build database systems and demonstrate their competence.

Course Outcomes (CO)

K1 to K4	CO1	Understand the concepts of Visual Basic
	CO2	Learn the advantages of Controls in VB
	CO3	Design and develop the event- driven applications using Visual Basic framework.
	CO4	Apply the knowledge of database methods.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS509		Core Paper 9 – Systems Software		
Batch 2020-2021	Semester V	Hours / Week 6	Total Hours 90	Credits 4

Course Objective

1. To comprehend the processing of programs on a computer system.
2. To understand the design and implementation of language processor.
3. To enhance the ability of program generation through expansion.
4. To gain knowledge about Code optimization and software tools.

Course Outcomes (CO)

K1 to K4	CO1	Know the program generation and program execution activities in detail.
	CO2	Understand the concepts of Macro Expansions.
	CO3	Gain the knowledge of Editing processes.
	CO4	Apply appropriate software tools for program development.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS510		Core Paper 10 – Java Programming		
Batch 2020-2021	Semester V	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms.
3. Concepts of inheritance, packages, interfaces and multithreading are introduced.

Course Outcomes (CO)

K1 to K4	CO1	Remember the fundamentals of programming such as variables, conditional statements and iterative execution statements.
	CO2	Understand the concepts of arrays, strings, packages and multithreading.
	CO3	Analyze the concepts of applet programming, graphics programming and files.
	CO4	Create a software application using the Java programming language

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS5CP		Core Practical 5 – Java Programming - Lab		
Batch 2020-2021	Semester V	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. This course introduces computer programming using the JAVA programming language with object-oriented programming principles.
2. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, graphics concepts, applet programming concepts etc.,
3. Upon completion, students should be able to design, code and debug JAVA language programs.

Course Outcomes (CO)

K1 to K4	CO1	Remember the fundamentals of Java programming language
	CO2	Understand the basics of Java programming, multi-threaded programs and Exception handling
	CO3	Analyze and use Java in a variety of applications.
	CO4	Write and debug a software application developed using the Java programming language.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS511		Core Paper 11 – Data Communication and Networking		
Batch 2020-2021	Semester V	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.
2. To be familiar with the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
3. Introduce the student to a network routing for IP networks and how a collision occurs and how to solve it and how a frame is created and character count of each frame.

Course Outcomes (CO)

K1 to K4	CO1	Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
	CO2	Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security
	CO3	Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
	CO4	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies;

Programme Code: B.Sc.		Title: Computer Science		
Course Code: 20UCS612		Title: Core Paper 12 – Artificial Intelligence		
Batch 2020-2021	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand the basic concepts of Artificial Intelligence (AI) and identify the AI problems and domains.
2. To provide search techniques to solve the problems.
3. To represent and access the domain specific knowledge.

Course Outcomes (CO)

K1 to K4	CO1	Understand the nature of AI problems and task domains of AI.
	CO2	Apply the appropriate search procedures to solve the problems by using best algorithms.
	CO3	Analyze and select the suitable knowledge representation method.
	CO4	Manipulate the acquired knowledge and infer new knowledge.
	CO5	Demonstrate the development of AI systems by encoding the knowledge.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS613		Core Paper 13 – Python Programming		
Batch 2020-2021	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To introduce the fundamentals of Python Programming.
2. To teach about the concept of Functions in Python.
3. To impart the knowledge of Lists, Tuples, Files and Directories.
4. To learn about dictionaries in python.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concept of operators, data types, looping statements in python programming.
	CO2	Understanding the concepts of Input / Output operations in file.
	CO3	Applying the concept of functions and exception handling
	CO4	Analyzing the structures of list, tuples and maintaining dictionaries.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS6CQ		Core Practical 6 – Python Programming - Lab		
Batch 2020-2021	Semester VI	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To gain knowledge about the concepts of python programming.
2. To understand the concepts of Built-in functions and User-defined functions.
3. To develop programs using String functions.

Course Outcomes (CO)

K1to K4	CO1	Remember different types of operators in programming.
	CO2	Implement the concepts of built-in functions in programming.
	CO3	Analyze the use control structures in programming.
	CO4	Apply the concepts of exception handling in programs.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS614		Core Paper 14 – Information Security		
Batch 2020-2021	Semester VI	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To learn basics of computer security and cyber crimes.
2. To familiarize the role of security in operations system and databases.
3. To know various types of viruses, attacks and threats in hardware, software and data security.

Course Outcomes (CO)

K1 to K4	CO1	Students can able to understand the basics of computer security and its terminology.
	CO2	Recapitulate various Attacks, Threats and Vulnerabilities in the system.
	CO3	Assess cyber security risk management policies in order to adequately protect critical information and assets.
	CO4	Students can employ, design and implement appropriate security technologies and policies to protect computers and digital information.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS6Z1		Project Work and Viva-Voce		
Batch 2020-2021	Semester VI	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.

Course Outcomes (CO)

K1 to K4	CO1	Identify and formulate the problem
	CO2	Analyze the problem and collect necessary data.
	CO3	Design and develop the project using appropriate software by applying the programming skills.
	CO4	Implement, evaluate and generate reports.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS4A4		Allied 4 – Digital Principles and Computer System Architecture		
Batch 2020-2021	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To educate the basics of computer hardware and how software interacts with computer hardware.
2. To familiarize with different numbering methods like binary, octal, and hexadecimal.
3. To impart the knowledge of buses, I/O devices, flip flops, Memory and bus structure.
4. To understand the concepts of memory hierarchy and compare different methods for computer architecture.

Course Outcomes (CO)

K1 to K4	CO1	Remember basic structure of computer and numbering methods like binary, octal and hexadecimal and explain how arithmetic and logical operations are performed by computers.
	CO2	Understand various data transfer techniques in digital computer and control unit operations.
	CO3	Apply performance issues in processor and memory design of a digital computer various data representations.
	CO4	Analyze architectures and computational designs and computer architecture concepts related to design of modern processors, memories and I/Os.

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS3S1		Skill Based Subject 1 – PHP Programming		
Batch 2020-2021	Semester III	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To learn the basic programming techniques using JavaScript and PHP.
2. To gain an insight of creating classes and using functions in PHP.
3. To learn the process of developing a PHP application and to work with files and directories.

Course Outcomes (CO)

K1 to K4	CO1	Remember the basic syntax of PHP and Java script
	CO2	Understand Arrays and Strings in PHP
	CO3	Implement the concepts of files and directories
	CO4	Evaluate the database connectivity using PHP and SQLite

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS4SL		Skill Based Subject 2 – PHP Programming Lab		
Batch 2020-2021	Semester IV	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To develop the ability to build efficient web based applications using PHP
2. To learn the basic constructs in PHP Programming.
3. To utilize the concepts of Strings and Array functions in PHP applications.

Course Outcomes (CO)

K1 to K4	CO1	Recollect the concepts of HTML Programming ,creating a web page using HTML and validate it using PHP
	CO2	Understand the concept of String functions and Arrays
	CO3	Validate the file system functions

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS6SM		Skill Based Subject 3 – Software Testing Lab		
Batch 2020-2021	Semester VI	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To gain knowledge about recording the test case in different modes.
2. To design and construct the test cases using Test Script Language.
3. To learn about GUI objects and bitmap objects

Course Outcomes (CO)

K1 to K4	CO1	Apply validation and verification in sample applications.
	CO2	Analyze the fields of the database and text area of the applications.
	CO3	Implement the concepts of checkpoints.

Programme Code : 09		B.Sc Computer Science		
Batch : 2020-2021		Elective Paper – Cloud Computing		
		Hours / Week 5	Total Hours 75	Credits 5

Course Objective

1. To understand the basic knowledge about the cloud computing techniques and architecture.
2. To learn the presents cloud computing collaborations and applications.
3. To impart the new concept of various virtualization in cloud computing
4. To gain knowledge of cloud services and cloud security.

Course Outcomes (CO)

K1 to K4	CO1	Understand the concepts of cloud Architecture and its services.
	CO2	Classify different services providers and its services, tools.
	CO3	Demonstrate various web based applications for collaborating everyone in the cloud computing.
	CO4	Analyze the best service provider for cloud computing in terms of storage, services.

Programme Code : 09	B.Sc Computer Science		
Batch : 2020-2021	Elective Paper – Network Security		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To learn the need for network security and security approaches.
2. To inculcate the concept of transferring authentic data along the network with several methods and algorithms.
3. To enrich the knowledge on different types of Internet Security Protocols.

Course Outcomes (CO)

K1 to K4	CO1	Remember the basic concept of Cryptography and various types of attacks.
	CO2	Understand about various types of protocols for Internet Security.
	CO3	Implement various algorithms for Cryptography
	CO4	Review Firewall and IP security

Programme Code : 09	B.Sc Computer Science		
Batch : 2020-2021	Elective Paper – Embedded Systems		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To teach all aspects of design and development of an embedded System.
2. To understand hardware and software of development system.
3. To earn the basic concepts of operating systems and embedded system project management.

Course Outcomes (CO)

K1 to K4	CO1	Acquire knowledge about microcontrollers embedded processors and their applications.
	CO2	Understand the internal architecture and interfacing of different peripheral devices with Microcontrollers.
	CO3	Apply key concepts of embedded systems like interrupts interaction, drivers, and ports with peripheral devices.
	CO4	Analyze the design concept of embedded systems.

Programme Code : 09	B.Sc Computer Science		
Batch : 2020-2021	Elective Paper – Big Data Analytics		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To understand and apply scaling up machine learning techniques and associated computing techniques and technologies.
2. To identify the characteristics of datasets and compare the trivial data and big data for various applications.
3. To recognize and implement various ways of selecting suitable model parameters for different machine learning techniques.

Course Outcomes (CO)

K1 to K4	CO1	Understand the different dimensions of digital data.
	CO2	Apply the concept of data classification on different types of data
	CO3	Analyze the characteristics of different patterns of data
	CO4	Implement the concept of bigdata in different scenarios

Programme Code : 09	B.Sc Computer Science		
Batch : 2020-2021	Elective Paper – Mobile Computing		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To learn the basic concepts of Mobile Computing and its Applications.
2. To provide various emerging technologies in Mobile computing services.
3. To gain knowledge about GSM, GPRS, CDMA and 3G.

Course Outcomes (CO)

K1 to K4	CO1	Remember the concept of Wireless LANs, PAN, Mobile Networks
	CO2	Understand positioning techniques of location-based services and applications
	CO3	Apply all techniques used in the GSM and GPRS
	CO4	Analyze CDMA and wireless LANS.

Programme Code : 09	B.Sc Computer Science		
Batch : 2020-2021	Elective Paper – Internet of Things		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To learn the concepts of IOT and its protocols.
2. To learn how to analysis the data in IOT.
3. To develop IOT infrastructure for popular applications.

Course Outcomes (CO)

K1 to K4	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Designing and develop smart city in IOT
	CO3	Analyzing various protocols for IOT.
	CO4	Analyzing applications of IOT in real time scenario

Programme Code : 09		B .Sc Computer Science		
Course Code: 20UCS5X1		EDC – Web Designing using HTML		
Batch 2020-2021	Semester V	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. The course introduces the basic concepts of the World Wide Web, principles and tools that are used to develop Web applications.
2. To develop an ability to design and implement static and dynamic website.
3. Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

Course Outcomes (CO)

K1 to K4	CO1	Remember the internet related concepts that are vital in understanding web development.
	CO2	Understand the important HTML tags for designing static pages
	CO3	Design and develop web pages using internal or external linking
	CO4	Develop interactive web applications through coding using HTML

Programme Code : 09	B.Sc Computer Science		
Non- Major Elective – Consumer Affairs			
Batch 2020-2021	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards.
3. To have a handle the business firms' interface with consumers and the consumer related regulatory and business environment.

Course Outcomes (CO)

K1 to K4	CO1	Able to know the rights and responsibility of consumers.
	CO2	Understanding the various procedure of redress.
	CO3	Applying the role of different agencies in establishing product and service standards.
	CO4	To enable them to handle the business firms' interface with consumers.