Maharshi Karve Stree Shikshan Samstha's

K. B. Joshi Institute of Information Technology

(*Approved by Govt. of Maharashtra, *NAAC Accredited) (Affiliated by S.N.D.T. Women's University, Mumbai)

Faculty: Science & Technology

Program Outcome Document

Program: Bachelor of Computer Applications (BCA)

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Program 1: Bachelor of Computer Applications (BCA) ProgramCode:059

Program Outcome:

- To provide basic knowledge and foundation of Computers for solving problem.
- To impart necessary skills to get worthy career in the field of Information Technology

Program Specific Outcome: After completion of the program, the students are able:

- To pursue higher education in the field of Computer Science and Applications
- To opt lucrative MBA course
- To work in the field of Information Technology as Programmer, System Designer, Analyst, Web Developer, Tester
- To work in public sector under Government.
- To initiate own start-ups

Course Objective and Outcome BCA

Semester I:

Subject: Business and Technical Communication Skills

Subject Code: 1101

Theory: 3+ Tutorial:1

Course Objectives

· To demonstrate the fundamental concepts of interpersonal and professional communication.

· To encourage active listening with focus on content, purpose, ideas.

· To facilitate fluent speakingskills in social, academic and professional situations.

· To train in reading strategies for comprehending academic and business correspondence. · To promote effective writing skills in business, technology and academic arenas.

Course Outcomes :

· Enable the students' ability to write error free while making an optimum use of correct Business Vocabulary & Grammar.

· Will enable the students to distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.

· They will be able to draft effective business correspondence with brevity and clarity.

· Enhance critical thinking by designing and developing clean and lucid writing skills.

· Enhance verbal and non-verbal communication ability through presentations.

Subject: Problem Solving Using C
Subject Code: 1102
Lectures : 4

Course Objectives:
· To teach students a programming language.
· To help them learn problem solving techniques.
· To teach the student to write programs in C and to solve the problems
Course Outcomes:
Students will be able
· To develop logic which will help them to create programs in C.
· Demonstrate an understanding of computer programming language concepts.
· Design and develop computer programs, analyze, and interpret the concept of pointers, declarations, initialization, operations on pointers and their usage.
· By learning the basic programming constructs they can easily switch over to any other language in future.
· Develop applications

Subject: Web Programming
Subject Code: 1103
Theory: 4
Course Objectives:
· To give insight about latest technologies to design and develop web applications using client- side scripting, server-side scripting, and database connectivity.
Course Outcomes:
· To design web pages using HTML5 language, applying stylish information to web pages using CSS.
· To develop interactive web pages using JavaScript.
· To develop dynamic pages on the web server using PHP language and implement Database Driven Websites.
· Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites
· To develop and implement client-side and server-side scripting language programs

Subject: Computer Fundamentals and Operating System
Subject Code: 1104
Theory:4

Course Objectives:

· To understand the proper working of operating system.

· To develop understanding of Computer operating system, its structures, functioning and algorithms.

· To ensure that students gain a solid understanding of the fundamental concepts modern multitasking operating system.

Course Outcomes:

· Learners will be able to describe basic concepts, mechanisms used by operating systems. · Learners will be able to compare process scheduling algorithms, apply synchronization primitives and evaluate deadlock conditions and to analyze virtual memory management algorithms

Subject: Office Automation Tools

Subject Code: 1105

Practical: 2

Course Objective:

· To familiarize the students in preparation of documents and presentations with office automation tools, internet and internet tools.

Course Outcomes:

· On completion, the students would be able to make word documents, spreadsheets, power point presentations using the Microsoft suite of office tools.

Subject: Problem Solving in C Lab

Subject Code: 1201

Practical:2

Course Objectives:

· To enable the students to learn a programming language.

· To learn problem solving techniques

· To teach the student to write programs in C and to solve the problems.

Course Outcomes:

The student would be able

· Read, understand and trace the execution of programs written in C language.

· Write the C code for a given algorithm.

· Implement Programs with pointers and arrays, perform pointer arithmetic, and use the preprocessor. •

· Write programs that perform operations using derived data types.

· Implement simple file operations

Subject: Web Programming Lab
Subject Code: 1202
Theory: 2

Course Objectives:

· To develop web applications using client-side scripting, server-side scripting, and database connectivity.

Course Outcomes:

· To design web pages using HTML5 language, applying stylish information to web pages using CSS.

· To develop interactive web pages using JavaScript.

· To develop dynamic pages on the web server using PHP language and implement Database Driven Websites.

· To develop and implement client-side and server-side scripting language programs

BCA Semester II:

Subject: Environmental Science and RTI
Subject Code: 2101
Environmental Science and RTI

Course Objectives:

· To help the students to acquire knowledge of pollution and environmental degradation.

· To help students acquire knowledge of the environment beyond the immediate environment including distant environment.

· To help students acquire a set of values for environmental protection.

· To provide students with an opportunity to be actively involved at all levels in environmental decision making.

· Describe the benefits of RTI.

· Identify the legal and historical foundations for RTI Course Outcomes: Students will learn to

· Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.

· Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.

· Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

· Understand the practical applicability of the Right to Information Act, 2005

Subject: Programming Methodology and C++
Subject Code: 2102
Theory:3+ Tutorial:1
Theory:4

Course Objective :
To understand how C++ improves C with object-oriented features.
♣ To learn how to design C++ classes for code reuse.
♣ To learn how to implement copy constructors and class member functions.
♣ To understand the concept of data abstraction and encapsulation.
♣ To learn how to overload functions and operators in C++.
♣ To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
♣ To learn how to design and implement generic classes with C++ templates

Course Outcomes:
· Students will be able to
· Describe the object-oriented programming approach in connection with C++
· Apply the concepts of object oriented programming
· Analyze a problem and construct a C++ program that solves it
· Discover errors in a C++ program and describe how to fix them
· Illustrate the process of data file manipulations using C++

Database Management System
Subject Code: 2103
Theory:4

- Course Objectives:
- · To introduce the concept of database management systems
- · Learn to organize, maintain and retrieve - efficiently, and effectively - information from a database management system

- · To present the concepts and techniques relating to query processing by SQL
- · To introduce the concepts of transactions and transaction processing
- · To present the issues and techniques relating to concurrency and recovery in multiuser database environments
- Course Outcomes:
- · Able to find and understand the Concept Of database approach.
- · Able to find and understand database architecture and data modeling, data Normalization.
- · Design and draw ER and EER diagram for real life problem.
- · Able to find and understand the commands of SQL.
- · Able to understand the concept of transaction, concurrency and recovery.Use new career opportunities available in IT profession, audits and others with special skills such as energy efficiency, ethical IT assets disposal, reporting and development of green products, applications and services.

Subject: Programming Methodology and C++ Lab
Subject Code: 2201
Practical:2

- Course Objectives: Will enable students to
- · Identify and practice the object-oriented programming concepts and techniques
- · Practice the use of C++ classes and class libraries, arrays, vectors, inheritance and file I/O stream concepts.
- Course Outcomes: Students will be able to:
- · Create simple programs using classes and objects in C++.
- · Implement Object Oriented Programming Concepts in C++.
- · Develop applications using stream I/O and file I/O.
- · Implement simple graphical user interfaces.
- · Implement Object Oriented Programs using templates and exceptional handling.

Subject: Database Management System Lab
Subject Code: 2202
Practical:2

Course Objectives:

· Understand, appreciate and effectively explain the underlying concepts of database technologies

Course Outcomes:

· Design and implement a database schema for a given problem-domain

· Normalize a database

· Populate and query a database using SQL DML/DDL commands.

· Programming PL/SQL including stored procedures, stored functions, cursors, packages.

BCA Semester III:

Subject: Data Strucutres
Subject Code: 3101
Theory:4

Course objectives:
· To impart basic concepts of data structures and algorithms
· To learn fundamental concepts about arrays, linked list, stack, queue, trees and graphs
· To understand concepts about searching and sorting techniques.
· To gain knowledge about writing algorithm and step by step approach in solving problems with the help of fundamental data structures.
· To find complexity of various algorithmic methods.
Course Outcomes:
· Understand basic data structures such as array, linked list, stack, queue, binary tree and graph along with algorithms.
· Ability to analyze algorithm and algorithm correctness.
· Apply searching and sorting techniques

Subject: Java Programming
Subject Code: 3102
Theory:4

Course Objectives:
· To 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.
· To understand the fundamentals of object-oriented programming in Java, including defining classes, objects, etc.
· To understand the principles of inheritance, packages and interfaces.
Course Outcomes:
· To teach Object-Oriented programming concepts, techniques, and applications using the Java programming language.
· Problem solving skills – to analyze real life problem, find and develop algorithmic steps to solve it and then implement these steps in JAVA.
· Experience with developing and debugging software in Java.
· To develop real life projects using database connectivity with JDBC..

Subject: Mathematics-II
Subject Code: 3103
Theory:4
Course objectives:
· To provide suitable and effective methods called numerical methods for obtaining approximate numerical results of the problems.

· To deal with various topics like finding roots of the equations, solving systems of linear algebraic equations, interpolation, numerical integration and differentiation, solution of differential equations and solution of matrix problems.

· To facilitate numerical computing.

Course Outcomes:

· Apply numerical methods to find solutions of algebraic equations using different methods viz. Bisection method, Regula - Falsi, Newton Raphson's, Ramanujan's method, Matrix Inversion and Gauss Elimination

· Apply Least squares Curve fitting procedures.

· Derive numerical methods for various mathematical operations and tasks such as interpolation, differentiation, integration, the solution of linear and non linear equations and solution of differential equations

Subject: Computer Organization and Architecture

Subject Code: 3104

Theory:2+Tutorial:2

Course Objectives:

· To introduce fundamental concepts of Boolean algebra, logic gates and combinational circuits

· To give a basicunderstanding of concepts and structure of computers.

· To understand the organization of Cache memory and memory management hardware. · To study the working of different interrupts & Mapping Techniques.

· To study register organization.

· To understand the different addressing modes.

· To Demonstrate the working of central processing unit and RISC and CISC Architecture.

Course Outcomes:

· Understand the architecture and functionality of central processing unit.

· Analyze some of the design issues in terms of speed, technology, cost, performance.

· Learn the concepts of parallel processing, pipelining and inter-processor communication.

· Exemplify the I/O and memory organization.

Subject: Data Structures Lab

Subject Code: 3201

Practical:2

- Course Objectives:
- · To introduce the concepts of data structures including arrays, linked list, stack and queues.

- · To design and implement various data structure algorithms.
- · To introduce various techniques for representation of the data in the world.
- · To create programs using algorithms and also techniques of sorting and searching. Course Outcomes:
- · Select appropriate data structures as applied to specified problem definition.
- · Implement operations like traversing, insertion, deletion, searching etc. on data structures.
- · Students will be able to implement linear and non - linear data structures.
- · Implement appropriate sorting and searching techniques for given problems..

Subject: Java Programming Lab

Subject Code: 3202

Practical:2

Lecture Timings: 50min Objectives:

Course Objectives:

· To develop software skills for developing real world applications using Java Programming language.

· To enable implementation of frontend and backend of an application.

· To implement classical problems using Java programming.

· To be able to use the Java SDK environment to create, debug and run simple Java programs.

Course Outcomes: · Basic knowledge of programming in JAVA.

· Experience with developing and debugging software in Java.

· Implementation of AWT.

· Able to develop real life projects using database connectivity with JDBC.

BCA Semester IV:

Subject: Python Programming
Subject Code: 4101
Theory: 3+Tutorial: 1

Course Objective:

· Learn the fundamentals of writing Python scripts.
· Learn core Python scripting elements such as variables and flow control structures.
· Discover how to work with lists and sequence data.
· Write Python functions to facilitate code reuse.

Course Outcome:

· Able to apply the principles of pythonprogramming.
· Write clear and effective pythoncode.
· Create applications using pythonprogramming.
· Implementing database usingSQLite.
· Access database using pythonprogramming.
· Develop web applications using pythonprogramming.
· Develop and use Web Services usingpython

Subject: Introduction to Microprocessor

Subject Code: 4102
Theory:3+Tutorial:1
Lecture Timings: 50min
Objectives:

Course Objectives:

· To learn and understand technical aspect of 8085 microprocessor.
· To understand the standard instruction set available for 8085 IC.
· To Design and develop various assembly language programs for 8085 IC and 8255 PPL.
· To learn the concept of interrupts
· To understand serial communication and interfacing.
· To understand advance microprocessor 8088/8086.

Course Outcomes:

· Understand the architecture and addressing modes of 8085 microprocessor and merory organization and its Interfacing.
· Understand various types of instructions and Instruction Cycled with proper timing diagrams.
· Develop various assembly language programs by usingdiffrent types if instructions and understand PPL interfacing.

· Understand 8259 interrupt controller IC with its internal organization and single and cascade operation.

· To understand 8086/8088 microprocessor, architecture, instruction set, addressing modes, simple programs, memory organization and interfacing

Subject: Computer Networks
Subject Code: 4103
Theory:4

- Course Objectives:
- · To study TCP/IP & OSI protocol suites
- · Learn how computer network hardware and software operate
- · Investigate the fundamental issues of network design
- · Learn about dominant network technologies
- Course Outcomes:
- · Distinguish between analog and digital signals and understand their characteristics
- · Understand the basic concepts of data communications.
- · Understand the purpose of network layered models, network communication using the layered concept, and able to compare and contrast Open System Interconnect (OSI) and the Internet Model.
- · Understand basic computer network technology.
- · Identify the different types of network topologies and protocols.
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Subject: Software Engineering
Subject Code: 4104
Theory:4

Course Objectives:

· To understand the nature of software development and software life cycle process models, agile practices.

· To Explain methods of capturing, specifying, visualizing and analyzing software requirements.

· To understand concepts and principles of software design and user-centric approach and principles of effective user interfaces.

· To understand need of project management and project management life cycle.

· To understand project scheduling concept and risk.

Course Outcomes:

· Provide the ability to select and apply the knowledge of defined engineering technology activities.

· Able to describe key activities in software development and the role of modeling.

· Able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

· Able to explain key concepts in software development such as change management, testing and quality.

Subject: Python Programming Lab
Subject Code: 4201
Practical:2

Course objectives:

· Install and run the Python interpreter
· Gain knowledge of Python syntax
· Learn variable declarations in Python
· Learn control structures
· Understand modules

Course Outcomes:

· Will be able to interpret the fundamental Python syntax usePython control flow statements. · Enable the handling of strings and functions.
· Will be able to create and run Python programs by utilizing the data structures like lists, dictionaries, tuples and sets

Subject: Introduction to Microprocessors Lab
Subject Code: 4202
Practical: 2

Course Objectives:

· To become familiar with the architecture and Instruction set of Intel 8085 microprocessor.. · To be able to develop simple assembly level programs

Course Outcomes:

· The student will be familiar with the architecture and Instruction set of Intel 8085 microprocessor
· Will be able to implement assembly level programs

BCA Semester V:

Subject: Mobile Application
Subject Code: 5101
Theory:3+Tutorial:1

Course Objectives:

· Understand the application development lifecycle.
· Develop a grasp of the Android OS architecture.
· Create an android based mobile application

· Familiarize with Android's APIs for data storage, retrieval, user preferences, files and content providers

· Experiment with database to store data locally

· Identity, analyze and choose tools for Android development including device emulator, profiling tools and IDE

Course Outcomes:

· Recognizes mobile development environments...

· Write clear and effective Android code.

· Create Native & Hybrid Mobile applications using Android App Development

· Implementing database using SQLite & Firebase Real-time Database.

· Be exposed to technology and business trends impacting mobile application

· Be competent with designing and developing mobile applications using one application development framework. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

- Identify the different types of network devices and their functions within a network

Subject: Artificial Intelligence
Subject Code: 5102
Theory:4

Course Objectives:

· To understand the basic principles, techniques, and applications of Artificial Intelligence.

· To understand the historical perspective of AI and its foundations.

· To understand a basic understanding of the building blocks of AI.

· To understand intelligent agents: Search, Knowledge representation, inference, logic, and learning.

Course Outcomes:

· Students will be able to demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.

· Students will be able to understand the fundamentals of various applications of AI techniques in intelligent agents, expert systems models.

Subject: Cyber Security
Subject Code: 5103
Theory:4

Course Objectives:

· The learner will gain knowledge about protect personal data, and secure computer networks.

· The learner will be able to examine secure software and wed security. The learner will be able to find solution to the key distribution problem by using functional key pair; public key cryptography

· The learner will develop an understanding of security policies (such as confidentiality, integrity, and availability), as well as protocols to implement such policies.

· The learner will be able to examine certain attacks on networks and security related services.

Course Outcomes:

The student will · Understand the basic security principals

· Understand the concepts of data confidentiality security concern and its solution through cryptography

· Be able to verify identity through various authentication mechanisms · Learn about Safeguarding the network at the network layer

· Learn about attacks on the networks and security related services

Subject: Multimedia Application

Subject Code: 5104

Theory: 4

Course Objectives:

· To learn and understand technical aspect of Multimedia Systems.

· To understand the standards available for colour model and different images, video and text applications.

· To Design and develop various Multimedia Systems applicable in real time

· To learn various multimedia authoring systems, computer graphics used for multimedia applications and Display devices.

· To understand Video signal formats and TV broadcasting system.

Course Outcomes:

· Learner will Developed understanding of technical aspect of Multimedia Systems.

· Learner will understand various file formats for images, video, text media, colour models and software tools.

· Learner will develop various Multimedia Systems applicable in real time with action script.

· Learner will design interactive multimedia softwareprogram multimedia data and be able to design and implement media applications.

· Learner will understand different graphics algorithm, Display devices, Video signal formats and TV broadcasting system.

Subject: Java Programming Lab
Subject Code: 5201
Practical: 2
Lecture Timings: 50min

Objectives:

- To learn how to extend Java classes with inheritance and dynamic binding.
- To learn how to use exception handling in Java applications.
- To understand how to design GUI components with the Java Swing API.
- To understand how to design applications with threads in Java. 🎬 To learn how to read and write files in Java.

Outcome:

- Writing program in java
- Able to use inheritance to extend class
- Able to do applet and GUI programming
- Able to implement file handling in Java

Subject: Internet Programming Lab
Subject Code: 5202
Practical: 2
Lecture Timings: 50min

Outcome:

- Learn about Web Page and the basic HTML tags.
- Learning of cookies and using cookie programs in web applications 🎬 Be able to create and use JavaScript programs
- Learn to create small web sites using HTML and CSS.

BCA Semester VI:

Subject: Management Information System
Subject Code: 6101
Theory:3+ Tutorial: 1
Lecture Timings: 50min

Objectives:

- Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
- Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
- Effectively communicate strategic alternatives to facilitate decision making.

Outcome:

- To Introduce the students to the Management information system

- To learn Basic terms in management & business
- To understand the working of marketing development, designing in the company
- To understand concept of information
- To learn levels in Management
- To understand financial & production functions of MIS 🎬 Understand and evaluate a computer based information system.
- to understand managerial issues related to the information systems.

Subject: Enterprise Recourse Planning
Subject Code: 6102
Theory:3+Tutorial:1
Lecture Timings: 50min

Objectives

- To introduce students to Enterprise Resource Planning.
- To understand the general model of ERP and how it works.
- To gain knowledge of various ERP departments with case studies
- To understand the difference between customer, vendor and suppliers.

Outcomes

- In-depth understanding of various concepts of ERP
- Ability to understand how it works from one department to the another 🎬 Ability to understand supply chain management, ERP methodologies. 🎬 To understand the role of costumer, vendor, supplier in ERP system
- Gain the knowledge of who is order winner and order qualifiers.

Subject: Intellectual Property Rights & Cyber Laws
Subject Code: 6103
Theory:4
Lecture Timings: 50min

Objectives:

- To introduce fundamental aspects of Intellectual property
- To give knowledge on patents, patent regime in India and abroad and registration aspects
- To give knowledge on copyrights and its related rights and registration aspects 🎬 To give knowledge on trademarks and registration aspects
- To give knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects **Outcome**

On completion of this course of study, students should be able to:

- Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact of intellectual property law and policy
- Understand IT Act 2000
- Analyse ethical and professional issues related to cyber laws and cyber crime.

Subject: Web Technology
Subject Code: 6113
Theory:2
Practical:2
Lecture Timings: 50min

Objectives:

- To understand internet and WWW
- To understand Cryptography
- To understand the syntax of Java script, Perl, ASP
- To learn security issue
- To learn web development software tools **Outcome:**
- Explain the history of the internet and World Wide Web.
- Concepts that are important in understanding web development like Digital Signature and Virtual Hosting.
- Discuss the understandings of internet programming with different scripting languages like Java script, Perl , ASP etc.
- Implement complete application over the web.
- Learn the important HTML tags for designing static pages.
- Ability to create separate design page from content using Cascading Style sheet.
- Utilize the concepts of JavaScript
- Use web application development software tools i.e. PHP and XML etc.
- Find the locations currently available in the market to design web sites.

Subject: Project
Subject Code: 6201
Practical:4
Lecture Timings: 50min

Objectives:

- Apply learning in real world
- Understand how real things are different compared to study
- What more needs to be learn before entering into industry
- Also, to learn how SDLC/System Analysis and Design work in real world.

Outcome:

- Students will able to implement knowledge in real applications
- Develop a software to solve problem
- Students will able to implement all phases of SDLC in practice
- Students are able to perform the job of Analyst, Programmer and tester.
- Insight of Software development process