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 Science- Information Technology(IT)

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Program 2: Bachelor of Science- Information Technology ProgramCode:

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
BSc IT Semester I:
Subject: Communication Skills
Subject Code: 1101
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:
- To develop competency in reading, writing and speaking skills
- To participate actively in technical communication at workplace
- To understand how to apply technical communication knowledge in practical documentation

Outcome:
- Ability to communicate fluently in business English at workplace
- Ability to effectively read and write the technical documents like email, official letters
- Effectively communicate with peers and top level

Subject: Mathematics-I
Subject Code: 1102
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objective:
- To enhances the ability to reason and ability to present a coherent and mathematically accurate argument.
- To develop the knowledge of application to computer Technology
- To impart knowledge regarding relevant topics like Integration

Outcomes:
After completing this course the student must demonstrate the knowledge and ability to:
- An ability to solve the problem on Matrix.
- Get the knowledge of Integration.
- Develop Problem Solving Approach.
- Develop Logical Reasoning

Subject: Introduction to IT
Subject Code: 1103
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:
- To introduce the students to the Information.
- To learn history and basic organization of computer
- To understand about memory
- To understand arithmetic operations in different number system such as binary octal hexadecimal
- To introduce computer languages
- To learn how signals, communicate with each other
- To understand transformation of media
- To learn different network, basic terms & working

Outcome:
- Students understand history and basic organization of computer
- Clear understanding of Memory and its Types
- Students understand binary number system and will able to implement binary arithmetic
- Understand about computer languages

Subject: Problem Solving Using 'C'
Subject Code: 1104
Theory: 3+ Tutorial:1
Lecture Timings: 50min

Objectives:
- To introduce students to a basic programming language – C.
- To understand the basic structure of a C program.
- To able to correct the syntax and logical errors in program.
- To develop problem solving attitude using algorithm and flowchart
- To enable the students to develop logics and programs.

Outcome:

- Students can characterize the Fundamentals of C Programming.
- Can Understand Problem solving and steps in problem solving.
- Implement Algorithm and Flowchart for faster computation in program.
- Understand Operators, I/O functions and header files.
- Understand Conditionals and Loop, Decision making structures and Loop Control structures to solve the problem.
- Understand how to apply 1D and 2D array.
- Understand the concept of Functions in C Programming.

Subject: C Programming Lab
Subject Code: 1201
Practical: 2
Lecture Timings: 50min
Objective:
- To introduce students to a basic programming language – C.
- To understand the basic structure of a C program.
- To able to correct the syntax and logical errors in program.
- To develop problem solving attitude using algorithm and flowchart
- To enable the students to develop logics and programs.

Outcome:
- Students are able to develop C Program
- Students can write the program source code in C to solve the Problem.
- Apply Conditionals and Loop, Decision making structures and Loop Control structures in C Program.
- Can Implement the program using Operators : Arithmetic, Logical, bitwise,
- Apply built in functions and operators in program.
- Implement 1D and 2D Array in C program.
- Implement User Define functions in C program.

Subject: Software Tools and Applications Lab
Subject Code: 1202
Practical: 2
Lecture Timings: 50min
Objectives:
- To learn HTML and write code for HTML program
- To understand all tags in HTML
- To learn basic functionality of visual basic
- To understand all basic tools of Visual Basic.

Program Outcome:

- Evaluate the office operation tools such as MS Word, MS Excel, Power point, Open Office, PDF
- Able to understand different editor works on different operating system
- Able to understand basic terms of internet technology

Subject: Environmental Science
Subject Code: 2101
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- Awareness: To help students to acquire knowledge of pollution and environmental degradation.
- Knowledge: To help students to acquire knowledge of the environment
- Attitudes: To help students to acquire a set of values for environmental protection.
- Participation: To provide social groups and individuals with an opportunity to be actively involved at all levels in environmental decision making.

Outcome:
Students will able to:

- Describe awareness and promote green agenda and green initiatives in their working environments leading to green movement
- Describe awareness of Global Warming with different solutions.
- Be capable to generate best out of waste.
- Describe awareness and promote Right of Information Act among Youth generation.
- Use Green IT Policies and metrics for ICT development.
- Illustrate various best green IT services practices and their role.
- 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: Operating Systems
Subject Code: 2102
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- To introduce to the students the basic functions of the computer system.
- To help understand the basic functioning of basic units of the computer system(i.e. input unit, output unit, control unit, CPU, etc)
- To give detail knowledge of different processes and its scheduling.
- To give detailed knowledge of routing algorithms for process scheduling
- To understand working of different types of printers.
- To understand working of different types of operating systems.

Outcomes:
- Familiarizes students with the basic functioning of the computer system.
- Help identify the students with different peripheral devices of the computer system.
- Help identify the students with different operating system.
- Familiarizing the students with the concepts such as paging, segmentation, etc

Subject: Computer Organization and Architecture
Subject Code: 2103
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- To introduce organization and architecture of Computer
- To introduce internal memory management
- To understand working of CPU

Outcome:

- Define Modern day Computer system
- Understand Organization, Architecture Structure and Functions of computer.
- Understand the System buses.
- Understand the concept of Memory in computer.
- Understand the internal memory-Concept of cache memory, cache mapping and cache coherency. And External Memory RAID.
- Define the Concept of I/O module, Interrupt Driven Module and DMA.
- Define the Operating System support.
- Understand the CPU organization, Register Organization, and Instruction Cycle and Instruction Pipelining.
- Concept of parallel processing, Multiprocessing.

Subject: Programming Methodology and C++
Subject Code: 2104
Practical: 2
Lecture Timings: 50min
Objectives:

- To deliver overview of benefits of Object Oriented Programming (OOP) approach over the Traditional programming approach.
- To understand the basic structure of C++ program.
- To enable the students to develop logic and programs.
- To identify different types of errors in the program.

Course Outcomes:

- Skills to write program code in C++ to solve real world problem.
- In-depth understanding of various OOP concepts.Ability to debug the program.
- Skill to read, understand and trace the execution of the program.

Subject: C++ Programming Lab
Subject Code: 2201
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- To understand the basic structure of C++ program.
- To enable the students to develop logic and programs.
- To identify different types of errors in the program.

Course Outcomes:

- Skills to write program code in C++ to solve real world problem.
- Ability to debug the program.
- Skill to read, understand and trace the execution of the program

Subject: UNIX/LINUX LAB
Subject Code: 2202
Practical: 2
Lecture Timings: 50min
Objectives:

- To understand and make effective use of linux utilities and shell scripting language to solve problems
- To implement in C some standard Linux utilities like mv,cp,ls etc…
- To Develop the skills the necessary for systems programming including file system programming, process and signal management and inter-process communication
- To develop the basic skills required to write network programs using sockets.

Outcome:

- Students will be able to understand the basic commands of Linux operating system and can write shell scripts.
- Students will be able to create file systems and directories and operate them.
- Students will be able to create processes backgroundand fore ground etc... By fork() system calls.
- Students will be create shared memory segements,pipes ,message queues and can exercise interprocess communication

<p style="text-align:center;color:red">Program: B SC IT
Semester III</p>

Subject: Data Structures
Subject Code: 3101
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- To understand classification of DS
- To study different data structures like Stack, Queue, Tree, Graph
- To study implementation and applications of Data structures

Outcome:

- Ability to communicate the basic concepts of data structures like array, pointers.
- Understand basic concepts about stacks, queues, lists.
- Ability to write algorithms and step by step approach in solving problems with the help of fundamental data structures.
- Ability to analyse algorithms and algorithm correctness.
- Solve problem involving graphs, trees and heaps
- Ability to solve problems like sorting, searching, insertion and deletion of data elements.

Subject: Database Management System & File System
Subject Code: 3102
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency
- To understand file organization and indexing
- To Understand query and transaction

Outcome:
- Students Can Define File System, Indexing and Hashing.
- Understand the Concept of B tree and B+ tree.
- Define the Advantages of DBMS over the File System.
- Define Query, Translate SQL query into relational algebra. And Estimate the cost of Query.
- Define transaction, steps in transaction and transaction processing.
- Define the basic properties of transaction (ACID) and Basic transaction operations.
- Define Locks and types of Locks, conversions of lock, starvation of lock to control concurrency.
- Understand Deadlock handling
- Understand 2PL(2 phase locking), Thomas Write rule and Timestamp.

Subject: Mathematics-II
Subject Code: 3103
Theory: 3+ Tutorial:1
Lecture Timings: 50min

Outcome:
    After completion of this course, the students will be able to
- Represent periodic functions using Fourier series
- Understands Laplace transform
- Get an idea of power series method to solve differential equations Familiar with Legendre equation
- and Legendre polynomial
- Learns about analytic function and how to check analyticity based on Cauchy – Riemann equation
- Knowing basic difference between real and complex calculus

Subject: Accounting and Finance Management
Subject Code: 3104
Theory: 3+ Tutorial:1
Lecture Timings: 50min

Objectives:
- Preparing financial statements of the firm.
- Interpreting the business implications of financial statement information.
- Preparing accounting information for evaluation of product

Outcome:
Students are able to:
- Understand the standards of bookkeeping and accounting
- explain functions of accounting
- describe the main elements of financial accounting information – assets, liabilities, revenue and expenses
- generate financial statements

Subject: Data Structures Lab
Subject Code: 3201
Practical: 2
Lecture Timings: 50min

Outcome
After completion of Lab session, the student will

- Be learn to add, delete items in stack and queue.
- Be capable to solve linked list problems using pointers.
- Using linked list students can build real time applications of linked list.
- Be capable to decide the appropriate data structure for given problem.
- Have practical knowledge on the applications of data structures

Subject: Database Management System & File
Subject Code: 3202
Practical: 2
Lecture Timings: 50min
Objectives:

- To introduce structured query language
- To teach oracle
- To make student understand table design and table manipulation
- To introduce concepts of normalization

Course Outcome:
- Students are able to write query in SQL.
- Able to create database and table.
- Implement the operations on database like insertion, deletion, updating, searching etc.
- Able to write and define Constraints.
- Alter Table and Fields.
- Can join two tables with different join operations
- Understand the normalization and its Types.

Subject: Software Engineering
Subject Code: 4101
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- This course introduces the concepts and methods required for the construction of large software intensive systems.
- It aims to develop a broad understanding of the discipline of software engineering.
- To understand the software development life cycle
- It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems.
- It aims to set these techniques in an appropriate engineering and management context.

Outcome:
Students can

- Able to understand the issues affecting the organisation, planning and control of software-based systems development.
- Able to complete the analysis and design of a small software
- Able to read and understand the requirement specification document
- Able to understand testing and Quality control

Subject: Multimedia and Animation
Subject Code: 4102
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Outcome:
Upon completion of the course the students will be able to:

- Create a well-designed, interactive Web site with respect to current standards and practices Demonstrate in-depth knowledge in an industry-standard multimedia development tool and its associated scripting language
- Determine the appropriate use of interactive verses standalone Web applications
- Create time-based and interactive multimedia components Identify issues and obstacles encountered by Web authors in deploying Web-based applications

Subject: Computer Networks
Subject Code: 4103
Theory: 4
Lecture Timings: 50min
Objective:

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts.
- To get Knowledge of Data Communication

Learning Outcomes: After completing this course the student must demonstrate the knowledge and ability to:

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- 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: System Programming
Subject Code: 4104
Theory: 4
Lecture Timings: 50min
Objectives:

- To understand the fundamental model of the processing of high level language programs for execution on computer system.
- To explain the basic operations that are performed from the time a computer is turned on until a user is able to execute programs.
- To understand and implement Assembler, Loader, Linkers, Macros & Compilers.
- To understand the process management and information management via different software tools.

Outcomes: By the end of the course students will be able to

- Understand different components of system software.
- Understand intermediate code generation in context of language designing.
- Recognize operating system functions such as memory management as pertaining to run time storage management.

Subject: Software Engineering Lab
Subject Code: 4202
Practical: 2
Lecture Timings: 50min
Outcome:

- Get knowledge of historical and modern software methodologies
- Understand the phases of software projects and practice the activities of each phase
- Practice coding
- Can successfully involve in Project Management

Subject: Multimedia and Animation Lab
Subject Code: 3202
Practical: 2
Lecture Timings: 50min
Outcome: Upon completion of the course the students will be able to:

- Create a well-designed, interactive Web site with respect to current standards and practices Demonstrate in-depth knowledge in an industry-standard multimedia development tool and its associated scripting language
- Determine the appropriate use of interactive verses standalone Web applications
- Create time-based and interactive multimedia components Identify issues and obstacles encountered by Web authors in deploying Web-based applications

Subject: Software Testing
Subject Code: 5101
Theory: 3+ Tutorial:1
Lecture Timings: 50min

Objectives:
- Understand correct testing terminology throughout the testing process.
- Implement specific software tests with well-defined objectives and targets.
- Understand various testing techniques, including domain, code, fault, usage and model-based.
- Execute program and test evaluations.

Outcome:
- Various test processes
- Types of errors and bugs
- Test case generation
- The use of various test tools in real time
- Application of Automation software testing techniques

Subject: Internet Security
Subject Code: 5102
Theory: 3+ Tutorial:1
Lecture Timings: 50min

Objectives:
- Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- Practice with an expertise in academics to design and implement security solutions.
- Understand key terms and concepts in Cryptography, Governance and Compliance.
- Develop cyber security strategies and policies
- Understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

Outcome:
After completion of the course, students will able to
- Analyse and evaluate the Internet security needs.
- Find software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems.
- Implement Internet security solutions
- Identify risk and vulnerability
- Design and develop a security architecture for an organization.

Subject: JAVA Programming
Subject Code: 5103
Theory: 3+ Tutorial:1
Lecture Timings: 50min
Objectives:

- To learn why Java is useful for the design of desktop and web applications.
- To learn how to implement object-oriented designs with Java.
- To identify Java language components and how they work together in applications.
- 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:

After completion of course students will able to do

- Write program in java
- Implement the features of java
- Exception handling
- Apple programming
- File handling
- Real time java applications
- Multi-Threading concept

Subject: Web Technologies
Subject Code: 5104
Theory: 3+ Tutorial:1
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.

Subject: JAVA Programming LAB
Subject Code: 5202
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: Web Technologies Lab
Subject Code: 5202
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.

Subject: Intelligent Property Rights, Patents and Cyber Laws
Subject Code: 6101
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 cybercrime.

Subject: Data Warehousing
Subject Code: 6102
Theory: 4
Lecture Timings: 50min
Objectives:
- Understand the basic definitions and concepts of data warehouses
- Understand data warehousing architectures
- Describe the processes used in developing and managing data warehouses
- Explain data warehousing operations
- Explain the role of data warehouses in decision support

Outcome:
- Store voluminous data for online processing
- Processing of the data for mining applications
- Apply the association rules for mining the data
- Design and deploy appropriate classification techniques

Subject: Mobile Computing
Subject Code: 6103
Theory: 4
Lecture Timings: 50min
Objectives:
- To impart fundamental concepts in the area of mobile computing
- To provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software

Outcome:

- Apply the fundamental design paradigms and technologies to mobile computing applications.
- Develop consumer and enterprise mobile applications using representative mobile devices and platforms using modern development methodologies.
- Design effective mobile interfaces using human computer interaction principles.
- Evaluate the role of mobile applications in software intensive systems.
- Evaluate the usability of representative mobile devices such as smartphones and tablets.
- Appraise the quality and performance of mobile applications.
- Assess and implement security principles in mobile applications.

Subject: Elective
Subject Code: 6104
Theory: 4
Lecture Timings: 50min

A) Business Process Reengineering
Outcome:

- BPR projects vary widely in terms of their scope. A project may address anything from one business process to the entire organization and its many processes.
- A wide variety of business processes are potential targets for reengineering: customer service, sales and order entry, invoicing and billing, purchasing, etc.
- BPR is to make business organizations more competitive by improving quality, reducing costs and shortening product development cycles

B) Introduction to Artificial Intelligence
Outcome:

- Apply the basic principles, models, and algorithms of AI to recognize, model
- Solve problems in the analysis and design of information systems.
- Analyse the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.
- Implement AI functions and components involved in intelligent systems such as computer games, expert systems, decision support systems, and intelligent

C) Customer Relationship Management
Outcome:

After completion of this course, the student will be able to

- Apply the concept of CRM, the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.
- Implement how CRM practices and technologies enhance the achievement of marketing, sales and service objectives throughout the customer life-cycle stages of customer acquisition, retention and development whilst simultaneously supporting broader organizational goals.
- Implement various technological tools for data mining and also successful implementation of CRM in the Organizations

D) Supply Chain Management
Outcome:

- Develop a sound understanding of the important role of supply chain management in today's business environment

- Become familiar with current supply chain management trends Understand and apply the current supply chain theories, practices and concepts utilizing case problems and problem-based learning situations

Subject: Academic Project LAB
Subject Code: 6201
Theory: 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