Aldel Education Trust's

St. John College of Humanities and Sciences

(A Christian Religious Minority Institution)

Affiliated to University of Mumbai

St. John Technical Campus, Vevoor, Manor Road, Palghar (East), **District** - Palghar, Maharashtra - 401404.

Tel: (02525)-297071, **Mob.:**7219230156 **Fax:** (02525)-256834 **Website** :www.sjchs.edu.in **Email** :office@sjchs.edu.in

BACHELOR OF SCIENCE- INFORMATION TECHNOLOGY

PROGRAMME OUTCOME:

PO1:	**Knowledge and Communication:** Apply innovation-based knowledge of Technology, mathematics, Networks, Database, Computing, digital circuitry and creative methods to provide valid conclusions for various scientific and business problems.
PO2:	**Problem analysis and development of solutions:** To be capable of managing complex IT projects with consideration of the human, financial and environmental factors.
PO3:	**Ethically and Socially Responsible:** To adhere to the highest standards of ethics, including relevant industry and organizational codes of conduct.
PO4:	**Life Long Learner and Researcher:** To recognize the need, the preparation and ability to engage in independent and life-long learning in every broad context of technological changes.
PO5:	**Teamwork/ Collaborators:** To work effectively as a part of a team to achieve a common stated goal.
PO6:	**Sensitive to Environment:** To develop an aptitude to engage in continuing development of e-environment with professional approach.
PO7:	**Competencies for employment:** To apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related postgraduate programmes.

PROGRAMME SPECIFIC OUTCOME:

PO1:	The program will facilitate learners to explore and expertise in different streams of Information Technology, giving them the opportunity to learn new edge technologies.
PO2:	The learners will be able to understand and build fundamental programming logic and implementation skills and will be able to write programs using trending programming language and techniques as per the industry needs and standards.
PO3:	The learner will be able to understand the concepts of statistics and will be able to apply skills in data science and business intelligence suits. The learner will be able to build hardware tools and automate them using the concepts learned in the areas of "Microprocessor Architecture", "Embedded Systems" and "IOT.
PO4:	The learner will be able to understand and implement basic networks for use of technology and resource sharing. They will also have full knowledge and skills to design databases, software applications, mobile applications and web-based applications.

St. John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar(E),Dist.Palghar-401404.

Aldel Education Trust's

St. John College of Humanities and Sciences

(A Christian Religious Minority Institution)

Affiliated to University of Mumbai

St. John Technical and Educational Campus, Vevoor, Manor Road, Palghar (East), Tal. & Dist. Palghar, Maharashtra - 401404.

Tel: (02525)-297071, Mob.:7219230156 , Email :office@sjchs.edu.in

Bachelor of Science-Information Technology

Semester	Subject		Course Outcome
FYBSc-IT SEM-I	Imperative Programming	CO1	Learn the basic principles of programming.
		CO2	Develop logic using algorithms and flowchart.
		CO3	Acquire the information about data types.
		CO4	Understanding of input and output functions.
		CO5	Enhance advanced concepts using programs.
	Digital Electronics	CO1	Apply number conversion techniques in real digital systems
		CO2	Solve boolean algebra expressions
		CO3	Derive and design logic circuits by applying minimization in SOP and POS forms
		CO4	.Design and develop Combinational and Sequential circuits
		CO5	Understand and develop digital applications
	Operating System	CO1	To understand the services provided by an operating system as a Resource Manager, processes synchronization and scheduling.
		CO2	To understand different approaches to memory management; Implementing virtual memory using paging and segmentation
		CO3	To understand file structure and its organization, I/O management and resource deadlocks
		CO4	To understand the concept of virtualization (VM-Hypervisors) and its requirements, multiprocessor systems.
		CO5	To introduce the students with the structure of different OS like, Linux, Windows and android
	Discrete mathematics	CO1	Write an argument using logical notation and determine if the argument is or is not valid
		CO2	Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.
		CO3	Prove basic set equalities Determine when a function is 1-1 and "onto".
		CO4	Demonstrate an understanding of relations and functions and be able to determine their properties. Model problems in Computer Science using graphs and trees
		CO5	Apply counting principles to determine probabilities.
		CO1	Learning 7 C's of communication for effective comm12unication
		CO2	Developing skills in business writing – letters, reports, proposals and resumes.

St. John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar 401 404.

	Communication Skills	**CO3**	To enhance listening skill to gain undivided attention during conversation, meeting, group discussion and team briefing
		CO4	Learning basic etiquettes in business communication which12 is a part in every sphere of life.
		CO5	Learning techniques and tools to design attractive, flawless 12and impressive business presentation
	Imperative programming Practical	**CO1**	Develop applications.
		CO2	Work with textual information, characters and strings.
		CO3	Understand of a functional hierarchical code organization
		CO4	Debug the program
		CO5	Understand the differences between syntax errors, runtime errors, and logic errors.
	Digital Electronics Practical	**CO1**	Construct basic and universal logic circuits.
		CO2	Verify the functionalities of various IC's.
		CO3	Design circuits using K-maps minimization technique
		CO4	Demultiplexers
		CO5	Design and develop logic for Registers, Counters and its applications.
	Operating System Practical	**CO1**	Installing virtual machine and various operating systems on VM
		CO2	To understand the use of various LINUX Commands like, files related, directory related, process related and system admin related.
		CO3	To understand the use of DOS Commands.
		CO4	To understand the working of various desktop utilities in like, word, paint, browsers, configurating network settings and creating users, vi editor e12tc
		CO5	To install utility software on WINDOWS and LINUX
	Discrete Mathematics Practical	**CO1**	Installation of the softwareScilab.
		CO2	Learn Basic syntax, Mathematical Operators, Predefined constants, Built in functions
		CO3	Complex numbers, Polynomials, Vectors, Matrix. Handling these data structures using built in functions
		CO4	Programming - Functions - Loops - Conditional statements - Handling .sci files
	Communication Skills Practical	**CO1**	Use different forms of digital mediums for effective communication.
		CO2	Create technical documents and format existing documents for effective communication.
		CO3	Learn to use graphical tools for better visualization.
		CO4	Create business presentations effectively.

		CO5	Visualize the data from pictorial representations.
FYBSc-IT SEM-II	Object Oriented Programming	CO1	12Understand the concept of OOPs, a feature of C++ language.
		CO2	Understand and apply various types of Data Types, Operators, Conversions while designing the program.
		CO3	Understand and apply the concepts of Classes & Objects, friend function, constructors & destructors in program design.
		CO4	Design & implement various forms of inheritance, String class, calling base class constructors.
		CO5	Apply & Analyze operator overloading, runtime polymorphism, Generic Programming.
		CO6	Analyze and explore various Stream classes, I/O operations and exception handling.
	Micro Processor and Microcontrollers	CO1	Understand the basic concepts of Micro Computer Systems
		CO2	Understand the architecture and hardware aspects of 8085
		CO3	Write assembly language programs in 8085
		CO4	Design elementary aspects of Micro Controller based systems
		CO5	Interfacing peripherals using Microcontroller
	Web programming	CO1	Analyze the working of the Internet.
		CO2	Gain an insight into designing web pages.
		CO3	Use different ways of styling web pages using CSS.
		CO4	Impl12ement basic and complex functionalities of JavaScript in a web page.
		CO5	Employ PHP Scripts to execute dynamic tasks in a web page.
		CO6	Perform various database tasks using PHP.
	Numerical Statistical Methods	CO1	Understand numerical techniques to find the roots of non-linear equations and solution of systems of linear equations.
		CO2	Understand the difference operators and the use of interpolation.
		CO3	Understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.
		CO4	Applying various graphical and data analysis methods for summarizing and understanding data.
		CO5	Applying various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.
	Green Computing	CO1	Understand the concept of Green IT and problems related to it.
		CO2	Know different standards for Green IT.
		CO3	Understand how power usage can be minimized in Technology.
		CO4	Learn about how the way of work is changing.
		CO5	Understand the concept of recycling.
		CO6	Know how information systems can stay Green Information systems.

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar 401 404.

	Object Oriented Programming with C++ Practical	CO1	Utilize C++ characteristics in software design and12 development.
		CO2	Explain object-oriented techniques and explain how C++ supports them.
		CO3	Employ C++ to demonstrate practical skill developing object-oriented solutions.
		CO4	Examine a problem statement and design and develop object-oriented software using good coding practices and procedures.
		CO5	In object-oriented design, use common software patterns and recognize their relevance in other software development contexts.
	Fundamentals of Micro Processor and Microcontrollers Practical	CO1	Apply concepts of 8085 to single & Multiple Memory Locations
		CO2	Apply concepts of microprocessor register operations
		CO3	Can implement assembly language programs
		CO4	Use of Shift registers 8 & 16 bits
		CO5	Apply the knowledge of Flash Magic in embedded Controllers
		CO6	Learns to simulate and configure different timer controls
	Web Applications Development Practical	CO1	Design static web pages using HyperText Markup Language (HTML).
		CO2	Enhance the look of web pages by implementing CSS.
		CO3	Collect information from the user with HTML Forms.
		CO4	Design interactive web pages using client-side script (JavaScript).
		CO5	Implement Document Object Model and events in web pages using JavaScript.
	Numerical Methods Practical	CO1	Find fast and accurate solutions to simple and complex numerical problems using these programs
	PL/SQL Practical	CO1	Understand the basics of PL/SQL.
		CO2	Use of the control and conditional statement in PL/SQL.
		CO3	Apply12 sequences and cursors in PL/SQL.
		CO4	Know the concept of stored procedure and functions
		CO5	Create the triggers and packages in PL/SQL.
SYBSc –IT SEM-III	Python Programming	CO1	Learn the basic principles of programming.
		CO2	Create a new function and perform operations of string
		CO3	Acquire the information about List, tuple, dictionary and files.
		CO4	Understand regular expression, class and object. Module
		CO5	Design GUI Form and Understand the basics of database
	Data Structures	CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation
			Understand basic data structures such as arrays,

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar 401 404.

		CO2	linked lists, stacks and queues.
		CO3	Solve problem involving graphs, trees and heaps
		CO4	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
		CO5	Describe the hash function and concepts of collision and its resolution methods
	Computer Networks	CO1	Understand computer network basics, network architecture, TCP/IP and OSI reference models.
		CO2	Identify and understand various techniques and modes of transmission
		CO3	Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme
		CO4	Describe routing and congestion in the network layer with routing algorithms and classify IPV4 addressing schemeDiscuss the elements and protocols of transport layer.
		CO5	Understand network security and define various protocols such as FTP, HTTP, Telnet, DNS
	Database Management Systems	CO1:	Define and describe the fundamental elements of relational database management systems.
		CO2:	Design ER-models to represent simple database application scenarios.
		CO3:	To relate the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
		CO4:	Transform the ER-model to relational tables, populate relational database and formulate SQL queries on data.
		CO5:	Improve the database design by normalization.
	Applied Mathematics	CO1:	Solve problems in the engineering domain related to Linear Algebra using matrices.
		CO2:	Analyze and solve engineering problems using Laplace Series
		CO3:	Solve engineering problems using Complex Integration
		CO4:	Analyze and solve Multiple Integrals:
		CO5:	Solve Beta and Gamma Functions
	Python Programming Practical	CO1:	write program using conditional statement and loop
		CO2:	Create a function
		CO3:	Use list,tuple, function in program
		CO4:	Create a GUI application
		CO5:	Link GUI with Database
	Data Structures Practical	CO1:	Find the location of an element in a given list.
		CO2:	Implementation of stack and queues using lists.
		CO3:	Basic 12operations like insertion and deletion operations associated with double linked lists.
		CO4:	Understand graphs and graph traversal techniques like Depth first search and Breadth first search
		CO5:	Understand the operations of binary search tree like tree traversals and counting the number of nodes in the binary search tree.

St. John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar 401 404.

	Computer Networks Practical	**CO1:**	Identify and use various networking components Understand different transmission media and design cables for establishing a network
		CO2:	Implement any topology using network devices
		CO3:	Implement device sharing on network
		CO4:	Implement rip, ospf, static routing
		CO5:	Learn to calculate IP address
	Database Management Systems Practical	**CO1:**	Design database schema for a given application and apply normalization.
		CO2:	Acquire skills in using SQL Commands for data Definition and data manipulation.
		CO3:	Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.
	Mobile Programming Practical	**CO1**	Setting up CORDOVA, PhoneGAP Project and environment.
		CO2	Install different plug-ins
		CO3	Developing cross platform applications for mobile device allowing standard web technologies HTML, CSS3 and JavaScript.
SYBSc-IT SEM-IV	**Core Java**	**CO1**	Learn Basic of data types and java environment
		CO2	Use flow statement,iteration, classes
		CO3	Explain inheritance and package
		CO4	Use expression,multithreading concept
		CO5:	Design GUI application.
	Introduction to Embedded Systems	**CO1**	Acquire a basic knowledge about fundamentals of microcontrollers
		CO2	Acquire a basic knowledge about programming and system control to perform a specific task.
		CO3	Develop programming skills in embedded systems for various applications.
		CO4	Acquire knowledge about basic concepts of circuit emulators.
		CO5:	Acquire knowledge about Life cycle of embedded design and its testing
	Computer Oriented Statistical Techniques	**CO1**	To Learn techniques to calculate the measures of central tendency and different measures of dispersion
		CO2	To Learn techniques to calculate the measures of central tendency and different measures of dispersion
		CO3	Drawing valid conclusion using estimation theory and proper decision using decision theory
		CO4	To measure experimental result based on hypothesis using chi square techniques
		CO5	To learn techniques to correlate the relationship between various variables
	Software Engineering	**CO1**	Students will gain a broad understanding of the discipline of software engineering and its application to the development and management of software systems

St John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar - 401 404.

		CO2	General understanding of various process models like, Iterative, Prototyping, Rapid Application Develo12pment, Rational Unified Process, Agile Method of development.
		CO3	To develop understanding of different software systems like, Socio-technical and Critical systems.
		CO4	Importance of requirement engineering process in developing SRS and understanding of various system models.
		CO5	Understanding of Architectural Design and User Interface Design concepts.
		CO6	To understand the role of Project Management in planning, scheduling, risk management and Quality Management in understanding industry wide standards
	Computer Graphics and Animation	CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
		CO2	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis
		CO3	Use of geometric transformations on graphics objects and their application in composite form.
		CO4	Extract scene with different clipping methods and its transformation to graphics display device.
		CO5	Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
	Core Java Practical	CO1	implementation of all core java concepts using JDK1.8
		CO2	Implement inheritance concept.
		CO3	Use file and will perform operation on file
	Introduction to Embedded Systems Practical	CO1	Building a reprogrammable embedded computer using 8051 microcontroller.
		CO2	Burn a executable program image into program memory of 8051.
		CO3	Implement a delay routine using 8051 timer registers
		CO4	To use serial and parallel communication ports of 8051 microcontroller.
		CO5	Use Digital to converter to generate waveforms using microcontroller
	Computer Oriented Statistical Techniques Practical	CO1	Learning the basic programming concepts and methods of R software
		CO2	Gaining knowledge on Implementation of various statistical techniques using R tool
	Software Engineering Practical	CO1	Hands on to StarUML - a complete solution to system modeling using several types of diagrams - Use Case Diagrams, Class Diagrams, Component Diagram, Sequence Diagram, Activity Diagram etc.
	Computer Graphics and Animation Practical	CO1	Drawing line,circle,rectangle, ellipse and half ellipse in C, C++ or python
		CO2	Developing programs for different algorithms like DDA, Bresenham's, midpoint circle drawing, midpoint ellipse drawing, Clipping and Fill

			algorithms.
		CO3	Imp12lementing 2D scaling and translation
		CO4	Performing animation programs
TYBSc-IT SEM-V	Software project Management	CO1	Identify the different project contexts and suggest an appropriate management strategy
		CO2	Practise the role of professional ethics in successful software development
		CO3	Identify and describe the key phases of project management.
		CO4	Determine an appropriate project management approach through an evaluation of the business context and scope of the project.
		CO5	Apply the risk management plan and analyse the role of stakeholders.
	Advanced Web Programming	CO1	Work with advanced features of http and web protocols, including full duplex and browser-to-browser communication
		CO2	Design, develop and deploy scalable web systems that present well-designed apis
		CO3	Use modern front end frameworks and browser features to develop complex web user interfaces
		CO4	Use web engineering tools and techniques to target the browser in a testable, maintainable manner
		CO5	Develop systems that use non-relational databases
	Internet of things	CO1	Able to understand the application areas of IOT
		CO2	Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Network
		CO3	Able to understand building blocks of Internet of Things and characteristics
		CO4	Understand the concept of Internet of Things
		CO5	Implement interfacing of various sensors with Arduino/Raspberry Pi.
	Artificial Intelligence	CO1	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
		CO2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
		CO3	Demonstrate awareness and a fundamental understanding of various applications of AItechniques in intelligent agents, expert systems, artificial neural networks and other machine learning models
		CO4	Understand sensorless with sensor planning
	Enterprise Java	CO1	Understand the theoretical underpinnings of Java Enterprise Edition (JEE)
		CO2	Learn to create applications using JEE!
		CO3	Learn how the various Java EE APIs work together to make you a productive developer
		CO4	Master a set of web services that can facilitate rapid development of strong enterprise level applications

		CO5	Write integration tests for Java EE components
	Project Dissertation	CO1	A real life or prototype of a working software model or embedded systems
		CO2	Implementing software engineering terminologies to build foundation for the project
		CO3	Experience of developing a model through analysis, design, development and deployment phases.
		CO4	Can be used as a prototype for further research.
	Advanced Web Programming Practical	CO1	Defines the principles learned in Visual Basics and applies them to the environment of the web.
		CO2	This course covers topics ranging from programming a basic, web-based shopping cart to integrating the application to a back-end database
		CO3	Topics covered in this course will include securing a web application, validating
		CO4	User input, managing web session state, using master template pages and themes for site consistency
		CO5	Web application data source connections and more.
	Internet of things Practical	CO1	Define the terms IoT and cloud computing
		CO2	Describe the evolution that has led to cloud computing
		CO3	Discuss the importance of IoT devices
		CO4	Identify the Components that forms part of IoT Architecture
		CO5	Setup the connections between the Devices and Sensors
	Artificial Intelligence Practical	CO1	Identify and Apply Artificial Intelligence concepts to solve real world problems.
		CO2	Create a Knowledge base.
	Enterprise Java Practical	CO1	Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).
		CO2	Apply event handling on Swing components.
		CO3	Make a reusable software component, using Java Bean.
		CO4	Create dynamic web pages, using Servlets and JSP.
		CO5	Use Struts frameworks, which give the opportunity to reuse the codes for quick development.
	Software Quality Assurance	CO1	Describe fundamental concepts of software quality assurance
		CO2	Explore test planning and its management
		CO3	Understand fundamental concepts of software automation.
		CO4	Demonstrate the quality management, assurance, and quality standard to the software system.

TYBSc-IT SEM-VI		CO5	Demonstrate Software Quality Tools and analyze their effectiveness.
	Business Intelligence	CO1	Describe the concepts and components of Business Intelligence (BI).
		CO2	Critically evaluate use of BI for supporting decision making in an organisation.
		CO3	Understand and use the technologies and tools that make up BI (e.g. Data warehousing, Data reporting and use of Online analytical processing (OLAP)).
		CO4	Understand and design the technological architecture that underpins BI systems.
		CO5	Plan the implementation of a BI system.
	Security in computing	CO1	Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure
		CO2	Design, develop, test and evaluate secure software
		CO3	Develop policies and procedures to manage enterprise security risks
		CO4	Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training
		CO5	Interpret and forensically investigate security incidents
	Geographic Information System	CO1	Describe what GIS is; name the major GIS software available; know where to find more information
		CO2	Explain the components and functionality of a GIS and the differences between GIS and Other information systems;
		CO3	Understand the nature of geographic information and explain how it is stored in computer (including map projection) and the two types of gis data structure;
		CO4	Conduct simple spatial analysis using GIS software;
		CO5	Design and complete a GIS project from start to finish (data capture, data storage and Management, analysis, and presentation);
	Cyber Law	CO1	Comprehend fundamental concepts and practices of Geographic Information Systems (GIS) using QGIS free software
		CO2	Apply basic graphic and data visualization concepts such as color theory, symbolization, and use of white space.
		CO3	Demonstrate organizational skills in file and database management.
		CO4	Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to.
	Business Intelligence Practical	CO1	Use the tool to extract data from different data sources
		CO2	Clean the and integrate the data
		CO3	Transform the data from one format to another.
		CO4	Visualize data
		CO5	Design Pivot table and pivot chart
		CO1	Build enterprise level mobile applications with Kotlin on Android

St. John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar - 401 404.

	Advanced Mobile Programming Practical	**CO2**	Understand both the basic and advanced concepts of Kotlin
		CO3	Explain and use key Android programming concepts
		CO4	Creating intuitive, reliable mobile apps using the android services and components
		CO5	Create a seamless user interface that works with different mobile screens
	Geographic Information System Practical	**CO1**	Comprehend fundamental concepts and practices of Geographic Information Systems (GIS) using QGIS free software
		CO2	Apply basic graphic and data visualization concepts such as color theory, symbolization, and use of white space.
		CO3	Demonstrate organizational skills in file and database management.
		CO4	Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to.
		CO5	Comprehend fundamental concepts and practices of Geographic Information Systems (GIS) using QGIS free software
	Security in computing Practical	**CO1**	Configure routers using various authentication techniques like AAA, OSPF MD5, NTP, support SSH conditions, log messages to Syslog server
		CO2	Configure, apply and verify ACL and extended numbered ACL
		CO3	Verify connectivity among devices before firewall configuration, configure IP acls to mitigate attacks and IPV6 acls, use acls to ensure remote access to the routers
		CO4	Configure IOS Intrusion Prevention System (IPS) Using the CLI, assign the Central switch as the root bridge, secure spanningtree parameters to prevent STP manipulation attacks, enable port security
		CO5	Configure and verify Site-to-Site ipsec VPN, ASA Basic Settings and Firewall using CLI, routing, address translation, and inspection policy, DHCP, AAA, and SSH, DMZ, Static NAT, and ACLS.
	Project Implementation	**CO1**	Create a software and hardware project
		CO2	Work in a team.
		CO3	Apply different Testing techniques.

St. John College of Humanities and Sciences SJCHS PALGHAR

Principal
St. John College of Humanities and Sciences
Palghar (E), Dist. Palghar 401 404.