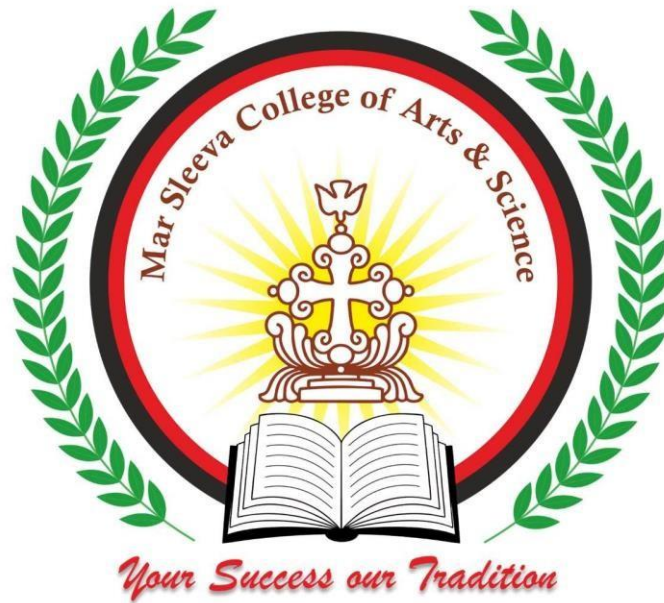# MAR SLEEVA COLLEGE OF ARTS AND SCIENCE

MURICKASSERY, RAJAMUDY P O

(Affiliated To Mahatma Gandhi University, Kottayam)

PROGRAMME OUTCOMES

PROGRAMME SPECIFIC OUTCOMES

&

COURSE OUTCOMES

BACHELOUR OF COMPUTER APPLICATION (BCA)

- ## Programme Outcomes

PO1 Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2 Problem Solving: Identify, formulate, conduct investigations, and find solutions to problems based on in-depth knowledge of relevant domains.

PO3 Communication: Speak, read, write and listen clearly in person and through electronic media in English/language of the discipline, and make meaning of the world by connecting people, ideas, books, media and technology.

PO4 Computational Thinking: Understand data-base reasoning through translation of data into abstract concepts using computing technology-based tools

PO5 Environment and Sustainability: Understand the impact of Technology and business practices in societal and environmental contexts, and sustainable development

PO6 Global Perspective: Understand the economic, social and ecological connections that link the world's nations and people.

- ## Programme Specific Outcomes

PSO1 Understand the basics of digital principles and organization of Computer system

PSO2 An ability to apply mathematical foundations and computer science theory in software design and implementation

PSO3 An ability to design algorithms, develop programming skills, learn and design automated system or applications

PSO4 Guide the students to get placed in reputed IT firms and

SEMSTER 1

Course code	Course Title		Course Outcome
EN1CC0 1	Fine-tune your English	CO1	Describe the basic rules of grammar in English for effective communication (understand level)
		CO2	Develop language learning skills Listening, Speaking, Reading and Writing (apply level)
		CO3	Develop the compositional skills and conversational skills in English in academic, professional and social contexts (apply level)
		CO4	Recognize the common and uncommon errors committed by the speakers in daily English conversation (remember level)
		CO5	Distinguish between the tense forms in English and identify the correct usage of tenses in sentences (understand level)
		CO6	Explain about the enrichment of English vocabulary through different word formation processes (apply level)
MM1C MT03	Mathematics	CO1	Write an argument using logical notation.(apply level)
		CO2	Explain whether the argument is valid or not.(understand level)
		CO3	Understand the basic principles of sets and operations in sets .(understand level)
		CO4	Determine when a function is one - one and onto .(evaluate level)
		CO5	Understand gcd and lcm(understand level)
		CO6	Apply the idea of 'modulo' in cryptology .(apply level)

		CO7	Understand the relations in a set and be able to determine their properties.(understand level, analyze level)
		CO8	Represent a relation using digraph , matrix and Hasse Diagram .(create level)
ST1CMT 01 ST1CMT 01	BASIC STATISTICSAND INTRODUCTORY PROBABILITY	CO1	Organize , manage and present data.(analyze level)
		CO2	Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.(analyze level, apply level)
		CO3	Analyze statistical data using measures of central tendency, partition values and dispersion.(analyze level, apply level)
		CO4	Analyze statistical data using Boxplot .(analyze level)
		CO5	Understand the basic probability concepts and definitions.(understand level)
		CO6	Apply additive , multiplicative and Bayes theorems using the terms, independent and mutually exclusive events.(apply level)
		CO7	Derive the probability density function ,mean variance and moment generating function of discrete and continuous random variables.(remember level, understand level)
A1CRT 01	Computer Fundamentals and Digital Principles	CO1	Understanding the fundamental concepts used in computer system and also familiarize the parts of computer(understand level, remember level)
		CO2	Understand the concept of operating

			system, various types of operating system(understand level)
		CO3	Understand the Basic idea of computer networks along with working of internet and features(understand level)
		CO4	Understand and examine the structure of various number systems and its application in computation(understand level, apply level)
		CO5	Understand analyze and design different combinational and sequential circuits(understand level, analyze level, create level)
		CO6	Familiarize with logic gates and boolean algebra and also simplify boolean expressions using basic Boolean properties and analyze and simplify the canonical expressions using K -Map(apply level, analyze level)
		CO7	Understand the basic idea of sequential circuits using flip flops and registers and design the combinational circuits such as MUX,DEMUX, encoder and decoder(create level, understand level)
		CO8	Obtain the basic level of digital electronics knowledge in Analog and digital circuits(analyze level)
CA1CRT 02	Methodology of Programming and C Language	CO1	Understand the basic concepts of Programming languages and its classification ,various translators(understand level)
		CO2	Understand the purpose of program planning develop algorithm , flowcharts and pseudocode(understand level, create level)
		CO3	Understand the basics of C programming Language, operators and expressions(understand level)
		CO4	Understand the importance and implementation of Decision and looping statements(understand level)

		CO5	Understand the basics and implementation of arrays and Strings and pointers(understand level)
		CO6	Design Programs using functions and understand the concepts of dynamic memory allocation(create level)
CA1CRP 01	Software Lab-I	CO1	Understand the concepts in problem solving(understand level, apply level)
		CO2	Write, compile and debug programs in Language(apply level)
		CO3	Develop programs using Decision structure, loops, strings, arrays(create level)
		CO4	Design programs involving structures, union and pointers.(create level)

SEMSTER II

		CO1	Identify the major issues of contemporary significance (understand level)
		C O2	Evaluate the issues raised positively and rationally (apply level)
EN2CC 03	Issues that Matter	C O3	Infer the values imparted through the literary works concerned (apply level)
		C O4	Transform them as conscious and concerned human beings (understand level)
MM2C MT03	Discrete Mathematics	CO1	Understand the basic concepts of Graph theory.(understand level)
		CO2	Develop models for real life situations using Graph theory.(create level)
		CO3	Understand the concepts of trees and tree traversal.(understand level)

		CO4	Apply tree traversal to data structure.(apply level)
		CO5	Make use of tree traversal algorithms in logical expressions.(apply level)
		CO6	Construct Boolean functions and logic gates.(create level)
		CO7	Analyse and simplify digital logic circuits by using Boolean algebra.(analyze level, apply level)
		CO8	Solve Matrix problems(analyze level, apply level)
CA2CRT 03	Database Management **Systems**	CO1	Understand the characteristics of Database approach(understand level)
		CO2	Discuss the relations, relationship models and relational database schemas(analyze level)
		CO3	Apply the SQL queries(apply level)
		CO4	Understand the Normalization and Indexing Structures for Files(understand level)
		CO5	Understand the transaction processing and Database security(understand level)
CA2CRT 04	Computer Organization and Architecture	CO1	Understand the basics of the organization and design of a computer system.(understand level)
		CO2	Understand the concepts of CPU registers and addressing modes.(understand level)
		CO3	Learn the instruction classification in detail(understand level)
		CO4	Learn the computer memory hierarchy and memory mapping techniques.(understand level)
		CO5	Understand the concepts of parallel computer structure.(understand level)
		CO6	Understand the concepts of pipelining and vector processing(understand level)
CA2CRT 05	Object oriented programming using C++	CO1	Understand the difference between object oriented and procedure oriented programming and basics and application of C++ programming(analyze level, apply level)
		CO2	Learn the concepts of objects and classes(understand level)

		CO3	Understand and implement constructor and destructor in C++ programming and the concept of polymorphism .(understand level, apply level)
		CO4	Understand different types of inheritance, abstract and virtual base class(understand level)
		CO5	Understanding pointers and virtual functions and file handling operations in C++(understand level)
CA2CRP 02	Software Lab- II	CO1	Develop solutions for a range of problem using objects and classes(create level)
		CO2	Apply object oriented concepts using data encapsulation, inheritance and polymorphism(apply level)
		CO3	Learn and implement the basic DDl and DML statements(apply level)
		CO4	Understand and implement basic SQL Queries, set operations and also usage of comparison operator(understand level, apply level)
		CO5	Study and implement complex and nested queries and also creation of stored procedures(create level, apply level)

SEMESTER III

ST3CM T32	Advanced Statistical Methods	CO1	Understand discrete and continuous statistical distributions.(understand level)
		CO2	Use discrete statistical distributions to solve statistical problems.(apply level)
		CO3	Understand the standard normal curves.(understand level)
		CO4	Evaluate appropriate areas under standard normal curves.(evaluate level)
		CO5	Evaluate the point and interval estimators ,understand their properties and methods of point estimation.(evaluate level, understand)
		CO6	Describe hypothesis testing in general.(understand level)

		CO7	Conduct hypothesis tests for population mean and population proportion with one sample and two samples.(analyze level)
		CO8	Use Chi-square test for testing Goodness of fit and independence of attributes.(apply level)
CA3CRT 06	Computer Graphics	CO1	Understand the concepts of computer graphics and introduction of various display devices(understand level)
		CO2	Understand how to Generate of Output primitives using various design algorithms(understand level)
		CO3	Understand the concepts of two dimensional geometric transformations, both basic and composite(understand level)
		CO4	Understand the window-view port concepts, transformation and also various clipping operations(understand level)
		CO5	Familiarize with various three dimensional display methods and object representation(analyze level)
		CO6	Learn motion specifications and design animation sequences(create level)
CA3CRT 07	Microprocessor and PC Hardware	CO1	Understand the features and architecture of Intel-8085 microprocessor(understand level)
		CO2	Learn about the instruction set of Intel-8085(understand level)
		CO3	Understand the basic components of motherboard(understand level)
		CO4	Learn about I/O bus and system buses(understand level)
		CO5	Understand harddisk components and features(understand level)
		CO6	Understand HDD installation procedure(understand level)
		CO7	Learn the types of memory including physical memory and memory modules(analyze level)
		CO8	Understand the basics of conventional base memory ,UMA, HMA ,extended and expanded memory(understand level)

CA3CRT 08	Operating Systems	CO1	Learn the basic structure and functions of operating system(understand level)
		CO2	Understand the basic of process, process scheduling and the associated scheduling algorithms(understand level)
		CO3	Learn about synchronization , its problems-the critical section and understand deadlock ,its occurrence and recovery(understand level, apply level)
		CO4	Learn various strategies of memory management(understand level)
		CO5	Understand the concepts of file system in storage management(understand level)
CA3CRT 09	Data Structure using C++	CO1	Understand the concept of data structure,dynamic memory allocation and different types of data structures(understand level, analyze level)
		CO2	Understand the concepts of array data structure and operations(understand level)
		CO3	Understand basic data structures such stacks and queues., application of stacks, different types of queues(understand level)
		CO4	Understand the concept of dynamic data structure and linked list implementation of stackand queue(understand level)
		CO5	Understand the basic concept of recursion,trees and binary trees(understand level)
		CO6	Understand different file organization methods(analyze level)
CA3CRP 03	SoftwareLabIII	CO1	Implement basic data structures such as arrays and linked list.(apply level)
		CO2	Implementation of various operations on stack and queue(apply level)
		CO3	Implement various searching and sorting algorithms(apply level)
		CO4	Demonstrate fundamental algorithmic problems of Tree Traversals(create level)

SEMESTER IV

MM4C MT03	Operational Research	CO1	Understand the basics of Operational Research(understand level)
		CO2	Formulate a real-world problem as a mathematical programming model(understand level)
		CO3	Understand and solve Linear Programming Problems(apply level)
		CO4	Solve LPP using Graphical method and Simplex(apply level)
		CO5	Solve specialized linear programming problems like the transportation and assignment problems(understand level)
		CO6	Understand and solve Game theory(understand level)
CA4CRT 10	Designand Analysis of Algorithms	CO1	Understand the basic concepts of algorithms,various algorithm design techniques and analyze the performance of algorithms(analyze level)
		CO2	Understand and implement Divide and conquer techniques for searching and sorting methods and estimate complexity(apply level)
		CO3	Understand Greedy method and solving problems using greedy method(apply level)
		CO4	Understand Dynamic programming method and solve problems based onthe concept of dynamic programming(understand level)
		CO5	Understand basic traversal and search techniques in trees and graphs(understand level)
		CO6	Understand backtracking method and solve problems based on the concept of backtracking(apply level)
CA4CRT 11	System Analysis & Software Engineering	CO1	Understand the concept of business informationsystem, its levels(Understand level)
		CO2	Learn the concept of SDL and baseline specifications(Understand level)
		CO3	Understand the basic concepts of software engineering and learnvarious software life cycle models(Understand level)

		CO4	Plan and implement the life cycle model in the software development(apply level)
		CO5	Elicit, analyze and specify the software requirements , conduct feasibility study with various stakeholders of the project.(analyze level)
		CO6	Learn various size and cost estimation techniques.(Understand level)
		CO7	Analyze and translate a specification into a design and understand software reliability and quality(analyze level)
		CO8	Understand the various levels of software testing and to prepare a test case suite .(Understand level)
CA4CRT 12	Linux Administration	CO1	Understand the fundamental concepts of open source operating system Linux(Understand level)
		CO2	Describe Directory & File commands in LINUX(Understand level)
		CO3	Learn the important LINUX library functions and system calls.(Understand level)
		CO4	Learn the Process management commands and their execution.(apply level)
		CO5	Understand Securing Files in LINUX with access permissions.(apply level)
		CO6	Understand the basic commands of Linux operating system and can write shell scripts(Understand level)
		CO7	Usage of Conditional Execution in Shell Scripts.(apply level)
		CO8	Apply and change the ownership and file permissions using advanced Unix commands(apply level)
		CO9	Demonstrate the role and responsibilities of a Linux system administrator.(analyze level)
		CO10	Distinguish various filter and server commands(analyze level)
CA4CRT 13	Web Programming using PHP	CO1	Understand the fundamentals of web creation(Understand level)
		CO2	Understand the dynamic nature of web pages using CSS and JavaScript(Understand level)

		CO3	Understand the concepts of server side scripting using PHP(apply level)
		CO4	Understand the basics of PHP functions and object oriented concepts of PHP(Understand level)
		CO5	Learn the relationship between client side and server side scripting language and concepts of MYSQL commands(Understand level)
		CO6	Design web page based on HTML, CSS ,JAVASCRIPT and PHP(create level)
CA4CRP 04	Software Lab-IV	CO1	Understand Basic Linux general purpose Commands(Understand level)
		CO2	Learn the syntax and usage of file systems and directory management commands with all options and operate them(Understand level)
		CO3	Create processes background and foreground etc.. exercise interposes communication and pipes(create level)
		CO4	Learn editors, permission advance commands and filters in Linux operating system(Understand level)
		CO5	Perform Shell Programming(analyze level)
		CO6	Design websites using HTML and CSS to demonstrate responsive web design(create level)
		CO7	Develop JavaScript based problems(create level)
		CO8	Create simple program based on PHP(create level)
		CO9	Develop programs using PHP function and MySQL(create level)

SEMESTER V

		CO1	Understand scientific applications of signal and Networks(understand level)
CA5CRT 14	Computer Networks	CO2	Understand data communication technologies(understand level)
		CO3	Understand the underlying principles of data link layer(understand level)

|			
		CO4	Understand the underlying principles of data communication protocols(understand level)
		CO5	Analyze the main concepts of communication devices and protocols used in network and transport layers(analyze level)
		CO6	Understand the protocols that are applicable to application layer(understand level)
		CO7	Understand security and vulnerable aspects of computer network(understand level)
CA5CRT 15	IT and Environment	CO1	Understand the importance of internet in academics(understand level)
		CO2	Understand the importance of environmental studies(understand level)
		CO3	Familiarize with various learning management systems and academic services.(analyze level)
		CO4	Know thevarious aspects of IT industry towards society(analyze level)
		CO5	Promotion of the development of innovative E- waste management techniques(understand level)
		CO6	Understand human rights in detail both in UN system and in our national perspective(understand level)
CA5CRT 16	Java Programming using Linux	CO1	Acquire the knowledge of OOPS concept used in Java programming language(apply level)
		CO2	Learn various control statements in Java(understand level)
		CO3	Understand the concept of constructors , super keyword,inheritance,interfaces(understand level)
		CO4	Learn about API packages and user defined packages(understand level)
		CO5	Understand various exception handling techniques(understand level)
		CO6	Learn about event handling swing architecture(understand level)
		CO7	Learn about applets and JDBC connectivity(understand level)

CS5OPT02	Computer Fundamentals, Internet and MS Office(T)(Open Course)	CO1	Describe the Fundamentals and Classifications of computers(understand level)
		CO2	Discuss the Operating System concepts and types of Networks.(analyze level)
		CO3	Explain the working of Internet and Networking concepts.(understand level)
		CO4	Outline the salient features of Word processing and construct documents by using Microsoft Word.(remember level)
		CO5	Make the students aware and expertise in MS Excel and its applications and learn to prepare spreadsheets emphasizing Microsoft Excel.(apply level)
		CO6	Demonstrate the features and applications of Microsoft PowerPoint and produce presentations by using MS PowerPoint.(analyze level)
CA5CRP 05	Software Lab V	CO1	Develop applet and swing programs and implement JDBC connectivity, along with response to events (create level)
		CO2	Develop a range of programs from method overloading to multithreading(create level)
		CO3	To demonstrate the reusability using inheritance , interface and packages(apply level)
CA5CRP 06	Software Development Lab I (Mini Project)	CO1	Identify the problem and elicit the requirements(analyze level)
		CO2	Analyze and design the project successfully by identifying the hardware and software requirements(PHP and MySQL)(analyze level, create level)
		CO3	Code and test the project(evaluate level)
		CO4	Prepare report and present the findings of the study(create level)
		CO5	Identify the importance of Responsibility in teamwork(analyze level)
		CO6	Develop confidence in presenting the work(create level)

SEMESTER VI

VICA6C RT17	Cloud Computing	CO1	Define Cloud Computing and memorize the different Cloud service and deployment models(remember level)
		CO2	Understand the fundamental principles of distributed computing.(understand level)
		CO3	Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.(understand level)
		CO4	Learn the Concept of Cloud Infrastructure Model(understand level)
		CO5	Understand Cloud Application Platform : Aneka(understand level)
		CO6	Use and Examine different cloud computing services(evaluate level)
CA6CRT 18	Mobile Application development- Android	CO1	Understand the concepts of Android platform and Android system architecture(understand level)
		CO2	Understand the concepts of Android Virtual Devices and Layouts(understand level)
		CO3	Understand the Android user interface(understand level)
		CO4	Familiarize the different types of user interface tools(analyze level)
		CO5	Understand the Android Activity Life Cycle and services(understand level)
		CO6	Understand the multimedia concept in Android(understand level)
		CO7	Understand manipulation of SQLite database in Android(understand level)
		CO8	Understand Telephoning and messaging in Android(understand level)
		CO9	Explain XML and JSON data transfer formats(understand level)
		CO10	Explain Google Play services(understand level)

CA6PET	Data Mining (Elective Core)	CO1	Study the basics of data mining ,data warehouse, classification and prediction(remember level)
		CO2	Learn about data preprocessing(understand level)
		CO3	Detailed study about data warehouse and learn the concepts of OLAP technology(understand level)
		CO4	Understand the association rules(understand level)
		CO5	Learn the basic and advanced classification methods(understand level)
		CO6	Learn the basic clustering methods including partitioning ,hierarchical and density based.(understand level)
		CO7	Understand the mining concepts of complex data(understand level)
CA6CRP 07	Software Lab-VI & Seminar	CO1	Installation and configuration of Eclipse and Development Tools(apply level)
		CO2	Creating simple apps using Interface Tools(create level)
		CO3	Creating Android Apps using SQLite(create level)
		CO4	Familiarizing with JSON and XML, Creation and distribution of Android Apps.(create level)
CA6CRP 07	Software Lab-VI & Seminar	CO1	Identify and analyze a subject(analyze level)
		CO2	Develop presentation skill(create level)
		CO3	Acquire a good manner of putting questions and to answer the questions of other effectives.(apply level)
CA6CRP 08	Software Development Lab II (Main Project)	CO1	Identify the problem and elicit the requirements(analyze level)
		CO2	Analyze and design the project successfully by identifying the hardware and software requirements(analyze level)
		CO3	To code and test the project(evaluate level)
		CO4	Prepare report and present the findings of the study(analyze level)

		CO5	Identify the efficiency in completing the project on time(understand level)
		CO6	Develop confidence in presenting the work(create level)
CA6VVT 01	VivaVoce	CO1	Acquire soundness of knowledge through various forms of questions(analyze level)
		CO2	Identify and analyze the presence of mind of students(analyze level)
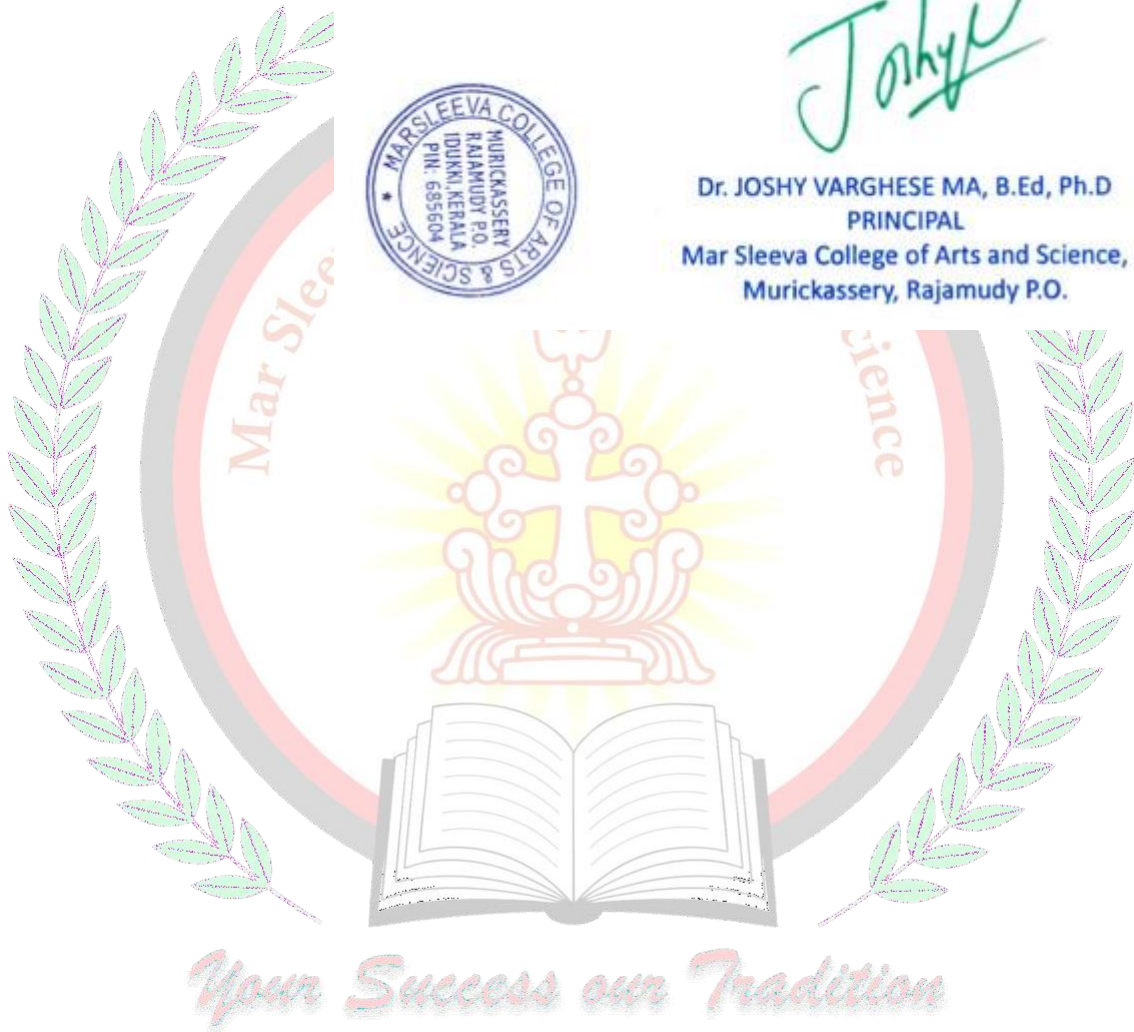
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