

**K.L.E Society's  
Raja Lakhamagouda Science Institute (Autonomous), Belagavi  
(PO's/PSO's/CO's)**

**Program: B. Sc. Mathematics & Computer Science (UG01C06)**

**Programme Outcome**

- PO1: Disciplinary knowledge and skills: Capable of demonstrating comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Mathematics & Computer Science and its different subfields.
- PO2: Critical thinker and problem solver: Ability to employ critical thinking and efficient problem-solving skills in the four basic areas of Mathematics & Computer Science.
- PO3: Sense of inquiry: Capability for asking relevant/appropriate questions relating to issues and problems in the field of Mathematics & Computer Science, and planning, executing and reporting the results of an experiment or investigation.
- PO4: Lifelong learners: Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling.

**Programme Specific Outcomes**

- PSO1: Students will realize and develop an understanding of the impact of Mathematics & Computer Science on society and apply conceptual understanding of the Mathematics & Computer Science in real life.
- PSO2: Perform effectively with professional ethics in analytical, scientific and technical domains.
- PSO3: Demonstrate subject-related and transferable skills that are relevant to Mathematics & Computer Science related job trades and employment opportunities.

## Course Outcomes

### Semester I

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN101	Generic English-I	<b>CO1:</b> Learn to appreciate literary texts. <b>CO2:</b> Obtain the knowledge of literary devices and genres. <b>CO3:</b> Acquire the skills of creativity to express one's experiences. <b>CO4:</b> Be aware of their social responsibilities. <b>CO5:</b> Develop the critical thinking skills.
AECC	21KA101	Kannada	<b>CO 1:</b> Create appreciation for Kannada language and culture through Kannada literature <b>CO 2:</b> Creating environmental awareness. <b>CO 3:</b> Developing scientific perspective through science literature. <b>CO 4:</b> Know the importance and various forms of Kannada Language
AECC	21HI101	Hindi	<b>CO1:</b> Create interest among the students by reading story. <b>CO2:</b> Will be familiar with the development sequence of modern Hindi story. <b>CO3:</b> Interest towards linguistic correctness will be created. <b>CO4:</b> Will be able to acquire writing skills. <b>CO5:</b> Know the importance and various forms of Hindi Language.
SEC	21CS111	Digital fluency	<b>CO1:</b> Have an intelligent conversation on the key concepts and applications of artificial intelligence (AI), Big data analytics (BDA), internet of things (IOT), Cloud computing, and cyber security. <b>CO2:</b> Develop holistically by learning essential skills such as effective communication, problem solving, design thinking, and team work. <b>CO3:</b> Build his or her personal brand has an agile and expensive learner- one who is interested in horizontal and vertical growth?
DSC	21MA101	Algebra-I and Calculus-I	<b>CO1:</b> Learn to solve system of linear equations and solve the system of homogeneous and non-homogeneous linear of $m$ equation in $n$ . And Variables by using concept of rank of matrix, finding eigen values and eigen vectors. <b>CO2:</b> Sketch curves in Cartesian, polar and pedal equations.

			<p><b>CO3:</b> Students will be familiar with the techniques of integration and differentiation of function with real variables.</p> <p><b>CO4:</b> Identify and apply the intermediate value theorems and L'Hospital rule.</p>
OEC	<b>21MA111</b>	<b>Algebra and Partial derivatives</b>	<p><b>CO1:</b> Link the fundamental concepts of groups and symmetries of geometrical objects.</p> <p><b>CO2:</b> Recognize the mathematical objects called Groups. Explain the significance of the notions of Cosets, normal subgroups and factor groups.</p> <p><b>CO3:</b> Understand the concept of differentiation and fundamental theorem sin differentiation and various rules. Find the extreme values of functions of two variables.</p>
DSC	<b>21MA102</b>	<b>Practical's on Algebra-I and Calculus-I</b>	<p><b>CO1:</b> Learn Free and Open-Source Software (FOSS) tools for computer programming</p> <p><b>CO2:</b> Solve problem on algebra and calculus theory studied in <b>21MA101</b> by using FOSS software's.</p> <p><b>CO3:</b> Acquire knowledge of applications of algebra and calculus through FOSS</p>
DSC	<b>21CS101</b>	<b>Computer Fundamentals and Programming in C</b>	<p><b>CO1:</b> Confidently operate Desktop Computers to carry out computational tasks and understand working of Hardware and Software and the importance of operating systems.</p> <p><b>CO2:</b> Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.</p> <p><b>CO3:</b> Perform input and output operations using programs in C.</p> <p><b>CO4:</b> Read, understand and trace the execution of programs written in C language.</p>
DSC	<b>21CSC102</b>	<b>Practical (Computer Fundamentals and Programming in C)</b>	<p><b>CO1:</b> Write a C Program to generate n primes, check it for palindrome, find roots of quadratic equation.</p> <p><b>CO2:</b> Write a C Program to demonstrate conditional statements.</p> <p><b>CO3:</b> Write a C Program that performs operations on arrays.</p> <p><b>CO4;</b> Write a C Program on the concept of pointers, string, structure and union.</p>

## Semester II

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN201	Generic English-II	<p>CO1: Learn to appreciate literary texts.</p> <p>CO2: Obtain the knowledge of literary devices and genres.</p> <p>CO3: Acquire the skills of creativity to express one's experiences.</p> <p>CO4: Be aware of their social responsibilities.</p>
AECC	21BO311	Environmental Studies	<p>CO1: define environmental study and ecology with basic principles.</p> <p>CO2: To examine the natural resources their types and utility.</p> <p>CO3: To identify the environmental usages, types of pollutions and their impact.</p> <p>CO4: To outline the diversity and explain the conservations and its significance.</p>
AECC	21KA201	Kannada-II	<p>CO 1: A good personality is formed by literature based on life values.</p> <p>CO 2: Students become ambitious to build a better life by achieving specific goals.</p> <p>CO3: Inspiring to always be enthusiastic in life.</p> <p>CO4: You will get complete knowledge of modern Kannada poetry.</p>
AECC	21HI201	Hindi-II	<p>CO1: Create interest among the students by reading story.</p> <p>CO2: Will be familiar with the development sequence of modern Hindi story.</p> <p>CO3: Interest towards linguistic correctness will be created.</p> <p>CO4: Will be able to acquire writing skills.</p> <p>CO5: Know the importance and various forms of Hindi Language.</p>
DSC	21MA201	Algebra-II and Calculus-II	<p>CO1: Link the fundamental concepts of groups and symmetries of geometrical objects.</p> <p>CO2: Recognize the mathematical objects called Groups. Explain the significance of the notions of Cosets, normal subgroups and factor groups.</p> <p>CO3: Understand the concept of differentiation and fundamental theorems in differentiation and various rules.</p> <p>CO4: Find the extreme values of functions of two variables.</p>
OECC	21MA211	Algebra and Partial derivatives	<p>CO1: Link the fundamental concepts of groups and symmetries of geometrical objects.</p> <p>CO2: Recognize the mathematical objects called Groups. Explain the significance of the notions of Cosets, normal subgroups and factor groups.</p>

			<b>CO3:</b> Understand the concept of differentiation and fundamental theorem in differentiation and various rules. Find the extreme values of functions of two variables.
DSC	21MA202	Algebra-II and Calculus-II	<b>CO1:</b> Learn Free and Open-Source Software (FOSS) tools for computer programming <b>CO2:</b> Solve problem on algebra and calculus by using FOSS software's. <b>CO3:</b> Acquire knowledge of applications of algebra and calculus through FOSS
DSC	21CSC201	Data Structure using C	<b>CO1:</b> Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms. <b>CO2:</b> Describe the concept of recursion; give examples of its use. <b>CO3:</b> Discuss the computational efficiency of the principal algorithms for sorting and searching. <b>CO4:</b> Write programs that use arrays, records, linked structures, stacks, queues, trees, different methods of traversing trees and graphs.
DSC	21CS202	Data Structures using C	<b>CO1:</b> Write a Program to generate Fibonacci series and tower of Hanoi using recursion. <b>CO2:</b> Write a Program for various Searching and Sorting Techniques. <b>CO3:</b> Write Programs that use arrays, records, linked structures, stacks, and queues. <b>CO4:</b> Write programs to implement different methods of traversing trees.

### Semester III

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN301	Generic English-III	<b>CO1:</b> Acquired enhanced LSRW (Listening, Speaking, Reading, Writing) skills <b>CO2:</b> Equipped themselves with interpersonal communication skills <b>CO3:</b> Augmented presentation and analytical skills <b>CO4:</b> Ability to critically analyses, interpret and appreciate literary texts <b>CO5:</b> An awareness of social, cultural, religious and ethnic diversities

AECC	21KA301	Kannada-III	<p>CO 1: By knowing about Bhakti Sahitya, you will have the quality of humanity.</p> <p>CO 2: Through travel literature, people will learn about the life and culture of different regions</p> <p>CO 3: The study of ideological literature will lead to revolution.</p> <p>CO 4: Know the importance and various forms of Kannada Language.</p>
AECC	21HI301	Hindi-III	<p>CO1: Able to understand One Act plays</p> <p>CO2: Learn to write various types of Letters</p>
SEC-2		<b>Constitution of India</b>	<p>CO1: To realise the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution.</p> <p>CO2: To identify the importance of fundamental rights as well as fundamental duties.</p> <p>CO3: To understand the functioning of Union, State and Local Governments in Indian federal system.</p>
DSC	21MA301	<b>Ordinary Differential Equations and Real Analysis – I</b>	<p>CO1: Solve first-order non-linear differential equations and linear differential equations.</p> <p>CO2: To model problems in nature using Ordinary Differential Equations.</p> <p>CO3: Formulate differential equations for various mathematical models</p> <p>CO4: Apply these techniques to solve and analyse various mathematical models.</p> <p>CO5: Understand the fundamental properties of the real numbers that lead to define sequence and series, the formal development of real analysis.</p>
OEC	21MA311	<b>Ordinary Differential Equations</b>	<p>CO1: Understand the concept of the differential equation and their classification</p> <p>CO2: Know the meaning of the solution of a differential equation.</p> <p>CO3: Solve first-order ordinary differential equations.</p> <p>CO4: Solve exact differential equations and converts to separable and homogenous equations to exact differential equations by integrating factors.</p> <p>CO5: Solve Bernoulli differential equations.</p> <p>CO6: Find the solution to higher-order linear differential equations.</p>
DSC	21MA302	<b>Practical: Ordinary Differential Equations and Real Analysis – I</b>	<p>CO1: Free and Open-Source software (FOSS) tools or computer programming.</p> <p>CO2: Solving exact differential equations</p> <p>CO3: Plotting orthogonal trajectories.</p> <p>CO4: Finding complementary function and particular integral of linear and homogeneous equations.</p>

DSC	21CS301	<b>Object Oriented Programming Concepts and Programming in JAVA</b>	CO1: To understand about the core java programming. CO 2: Understanding how to create the objects and classes in java programming. CO 3: To understand about the pillars of java programming such as inheritance, polymorphism and also handling erroneous situations. CO 4: To learn input output classes of the java and also to learn about multitasking.
OEC	21CS311	Multimedia & Animation	CO1: To get introduce about the multimedia and also to understand the components of multimedia. CO2: Understanding history of animation, applications and also methods/techniques of animation. CO 3: To learn about the types of visual effects and also the voice and video editing.
DSC	21CS302	<b>Practical (Object Oriented Programming Concepts and Programming in JAVA)</b>	CO1: Understand what is the Fibonacci series is and also to implement the same using repetitive function calling and loops. CO2: Practise the occurrence of each element in an array. CO3: Learn to perform the multiplication operation on two matrices. CO4: To understand the many forms of same methods and constructors. CO5: Get to learn the concept of constructor.

### Semester IV

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN401	Generic English-IV	CO1: Acquired creative, interpretative and critical thinking CO2: Skills to communicate confidently and effectively CO3: Obtained persuasive and creative social media writing skills CO4: Developed analytical and evaluative skills CO5: Learnt to identify and understand social contexts and ethical frameworks in the texts
AECC	21KA401	Kannada-IV	CO 1: Learn to live in harmony by learning about the oppressed race. CO 2: students will live in tolerance with each other. CO 3: By understanding the life of common people, one will know the essence of simple life

			<b>CO 4:</b> Know the importance and various forms of Kannada Language
A ECC	21HI401	Hindi-III	CO1: Able to understand Hindi Novels CO2: Able to understand the importance of Mass Media and Communication
SEC-2		<b>Artificial Intelligence</b>	CO1: To get introduced about the concept of artificial intelligence and machine learning. CO2: Understanding data analysis process i.e. preparation, modelling, visualization. CO3: It is to learn about the robotics, types of robots and also components of robots.
DSC	21MA401	<b>Partial Differential Equations and Integral Transforms</b>	CO1: Solve the Partial Differential Equations of the first order and second order. CO2: Formulate, classify and transform partial differential equations into canonical form. CO3: Solve linear and non-linear partial differential equations using various methods. and apply these methods to solving some physical problems. CO4: Able to take more courses on wave equation, heat equation, and Laplace equation. CO5: Solve PDE by Laplace Transforms and Fourier Transforms. and gamma function.
OEC	21MAT411	<b>Partial Differential Equation</b>	CO1: Explain the concept of the differential equation. CO2: Classifies the differential equations concerning their order and linearity. CO3: Explains the meaning of the solution of a differential equation. CO4: Solve first-order ordinary differential equations.
DSC	21MA402	<b>Practical's: Complex Analysis, Improper integrals and Beta and Gamma Function</b>	CO1: Free and Open-Source software (FOSS) tools or computer programming. CO2: Acquire knowledge about Fundamentals of Complex analysis using Sci-Lab. CO3: Plot the Complex functions by their images over concentric circles. CO4: Able to write the programs to find the analytic function using C-R equation.
DSC	21CS401	<b>Database Management System</b>	CO1: To learn about the database management system and also, its architecture. CO2: To understand about the relationship modelling, also the deeper concept of attributes. CO3: To handle the relational operations on the data and the process of normalization. CO4: Learning about the transactions, ACID properties.



OEC	21CS411	<b>Multimedia &amp; Foundations of Data Science</b>	<p>CO1: Understanding about the concept of data science managing data and NOSQL.</p> <p>CO2: Learn how to map problems to machine learning.</p> <p>CO 3: Get to know the R language. Arrays, matrices, Files.</p> <p>CO4: Learning about the Documentation and deployment.</p>
DSC	21CS402	<b>Practical (Database Management System)</b>	<p>CO1: Understand creation of database &amp; also to learn to modify the values.</p> <p>CO2: To learn display of tables and deletion process.</p> <p>CO3: To understand remove operation.</p> <p>CO4: To learn arrangement of tuples in alphabetic manner.</p> <p>CO5: To perform operations like sum and average on database.</p>