

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

**Program: B. Sc. Chemistry & Zoology (UG01C10)**

**Programme Outcome**

- PO1: Disciplinary knowledge and skills: Capable of demonstrating comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Chemistry & Zoology 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 Chemistry & Zoology.
- PO3: Sense of inquiry: Capability for asking relevant/appropriate questions relating to issues and problems in the field of Chemistry & Zoology, 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 Chemistry & Zoology on society and apply conceptual understanding of the Chemistry & Zoology 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 Chemistry & Zoology 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 expansive learner- one who is interested in horizontal and vertical growth?
DSC	21CH101	Fundamentals of chemistry	<b>CO1:</b> Analyze the analytical methods, Errors and treatment of analytical data and gain knowledge about balance in redox equations, titration curves, theory of redox in metal-ion indicators and applications

			<p><b>CO2:</b> Describe the dual nature of radiation and matter, Quantum mechanics, Orbital shapes, electronic configurations of the atoms and periodicity.</p> <p><b>CO3:</b> Explain bond properties, electron displacement effects, organic reaction mechanism, configurationally and conformational isomers.</p> <p><b>CO4:</b> Explain the existence of different states of matter, laws of ideal gases and real gases and understand cooling effect of gas.</p>
OEC	<b>21CH111</b>	<b>Chemistry in Daily life-1</b>	<p><b>CO1:</b> Understand the chemical constituents in various day to day materials using by a common man.</p> <p><b>CO2:</b> Understand the chemical Composition and analysis of milk and milk products, beverages, food preservatives and analysis of pesticides residue in food.</p> <p><b>CO3:</b> Understand the chemical constituents in chemical fuels and polymers.</p>
DSC	<b>21CH102</b>	<b>Chemistry Lab-1</b>	<p>After successful completion of first semester in Chemistry a student should be able to;</p> <p><b>CO1:</b> Understand principles of different type's titrations. Titration curves for all types of acids–base titrations.</p> <p><b>CO2:</b> Gain knowledge about balance in redox equations, titration curves, theory of redox indicators and applications.</p> <p><b>CO3:</b> Gain knowledge about estimation of some organic compounds such as Aniline and Amide</p>
DSC	<b>21ZO101</b>	<b>Cytology, Genetics and Infectious Diseases</b>	<p><b>CO1:</b> Students are able to understand the basic unit of life.</p> <p><b>CO2:</b> Ability to understand the structure and functions of Nucleus, types of DNA, RNA, ultrastructure of chromosome and importance of cell division.</p> <p><b>CO3:</b> To impart the knowledge to understand the various principles of Inheritance.</p> <p><b>CO4:</b> Students are able to gain knowledge of sex-linked inheritance, chromosomal structural and numerical aberrations and also understand various parasites that affect human beings, their life cycle, treatment and preventive measures.</p>
OEC	<b>21ZO111</b>	<b>ECONOMIC ZOOLOGY</b>	<p><b>CO1:</b> Students gain the knowledge of various parasites that affect human beings, their life cycle, treatment and preventive measures.</p>

			<p><b>CO2:</b> Provides knowledge about parasitic Nematodes, Arthropods and Vertebrates and their life cycle, pathogenicity and control measures.</p> <p><b>CO3:</b> Imparts the knowledge about fundamental techniques used in molecular diagnosis.</p>
DSC	<b>21ZO102</b>	<b>Cytology, Genetics and Infectious Diseases</b>	<p><b>CO1:</b> Students gain knowledge of Sericulture and Apiculture and are able to apply their skill and take up entrepreneurship.</p> <p><b>CO2:</b> To gain the knowledge of Dairy, Poultry and Aquaculture and are able to apply their talent and acquire the ability of entrepreneurship</p> <p><b>CO3:</b> Students develop skill in Fish culture, Prawn culture, Vermiculture and Lac culture techniques.</p>

## Semester II

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN201	Generic English-II	<p><b>CO1:</b> Learn to appreciate literary texts.</p> <p><b>CO2:</b> Obtain the knowledge of literary devices and genres.</p> <p><b>CO3:</b> Acquire the skills of creativity to express one's experiences.</p> <p><b>CO4:</b> Be aware of their social responsibilities.</p>
AECC	21BO311	Environmental Studies	<p><b>CO1:</b> define environmental study and ecology with basic principles.</p> <p><b>CO2:</b> To examine the natural resources their types and utility.</p> <p><b>CO3:</b> To identify the environmental usages, types of pollutions and their impact.</p> <p><b>CO4:</b> To outline the diversity and explain the conservations and its significance.</p>
AECC	21KA201	Kannada-II	<p><b>CO 1:</b> A good personality is formed by literature based on life values.</p> <p><b>CO 2:</b> Students become ambitious to build a better life by achieving specific goals.</p> <p><b>CO 3:</b> Inspiring to always be enthusiastic in life.</p> <p><b>CO 4:</b> You will get complete knowledge of modern Kannada poetry.</p>
AECC	21HI201	Hindi-II	<p><b>CO1:</b> Create interest among the students by reading story.</p> <p><b>CO2:</b> Will be familiar with the development sequence of modern Hindi story.</p>

			<p><b>CO3:</b> Interest towards linguistic correctness will be created.</p> <p><b>CO4:</b> Will be able to acquire writing skills.</p> <p><b>CO5:</b> Know the importance and various forms of Hindi Language.</p>
OEC	21CH211	Molecules of life	<p><b>CO1:</b> Acquire knowledge about different types of sugars and their chemical structures and Identify different types of amino acids and determine the structure of peptides.</p> <p><b>CO2:</b> Explain the actions of enzymes in our body and interpret enzyme inhibition, Predict action of drugs. Depict the biological importance of oils and fats.</p> <p><b>CO3:</b> Understand the importance of lipids in the metabolism Differentiate RNA and DNA and their replication. Explain production of energy in our body.</p>
DSC	21CH201	Fundamentals of chemistry - 2	<p><b>CO1:</b> Understand the chemical bonding, molecular structure &amp; periodicity of elements.</p> <p><b>CO2:</b> Explain the concepts of acidic strengths of organic compounds and stereochemistry.</p> <p><b>CO3:</b> Describe the solids &amp; liquid crystals-Forms of solids and classification of Liquid Crystals.</p> <p><b>CO4:</b> Understand the Chemical Kinetics, Liquid State, Surface tension, Viscosity and Refractive index</p>
DSC	21CH202	Content of Chemistry Lab-2	<p><b>CO1:</b> Understand the different type's titrimetric experiments</p> <p><b>CO2:</b> Gain the knowledge about determination of <math>Ba^{2+}</math> and <math>Cu^{2+}</math> by gravimetric methods.</p> <p><b>CO2:</b> Gain the knowledge about determination of Density, Viscosity and Surface tension.</p>
DSC	21ZO201	Biochemistry and Physiology	<p><b>CO1:</b> Students are able to gain knowledge of the various biomolecules and their importance to understand the biochemical reactions in human body.</p> <p><b>CO2:</b> Helps students to understand the metabolic pathways in human body.</p> <p><b>CO3:</b> Students acquire knowledge of the process of digestion and respiration in man.</p> <p><b>CO4:</b> Students gain knowledge about the function of nervous system and understand the major controlling, regulatory and communication system along with endocrine system and muscle contraction.</p>
OEC	21ZO211	PARASITOLOGY	<p><b>CO1:</b> Students gain the knowledge of various parasites that affect human beings, their life cycle, treatment and preventive measures.</p> <p><b>CO2:</b> Provides knowledge about parasitic Nematodes, Arthropods and Vertebrates and their life cycle, pathogenicity and control measures.</p> <p><b>CO3:</b> Imparts the knowledge about fundamental techniques used in molecular diagnosis.</p>

DSC	21ZO202	Biochemistry and Physiology	<p><b>CO1:</b> Students gain the knowledge of various parasites that affect human beings, their life cycle, treatment and preventive measures.</p> <p><b>CO2:</b> Provides knowledge about parasitic Nematodes, Arthropods and Vertebrates and their life cycle, pathogenicity and control measures.</p> <p><b>CO3:</b> Imparts the knowledge about fundamental techniques used in molecular diagnosis.</p>
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### Semester III

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN301	Generic English-III	<p><b>CO1:</b> Acquired enhanced LSRW (Listening, Speaking, Reading, Writing) skills</p> <p><b>CO2:</b> Equipped themselves with interpersonal communication skills</p> <p><b>CO3:</b> Augmented presentation and analytical skills</p> <p><b>CO4:</b> Ability to critically analyses, interpret and appreciate literary texts</p> <p><b>CO5:</b> An awareness of social, cultural, religious and ethnic diversities</p>
AECC	21KA301	Kannada-III	<p><b>CO1:</b> By knowing about Bhakti Sahitya, you will have the quality of humanity.</p> <p><b>CO2:</b> Through travel literature, people will learn about the life and culture of different regions</p> <p><b>CO3:</b> The study of ideological literature will lead to revolution.</p> <p><b>CO4:</b> Know the importance and various forms of Kannada Language.</p>
AECC	21HI301	Hindi-III	<p><b>CO1:</b> Able to understand One Act plays</p> <p><b>CO2:</b> Learn to write various types of Letters</p>
SEC-2		<b>Constitution of India</b>	<p><b>CO1:</b> 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><b>CO2:</b> To identify the importance of fundamental rights as well as fundamental duties.</p> <p><b>CO3:</b> To understand the functioning of Union, State and Local Governments in Indian federal system.</p>
DSC	21CH301	Fundamentals of chemistry - 2	<p><b>CO1:</b> Understand the importance of fundamental law and validation parameters in chemical analysis to know how different analytes in different matrices (water and real samples) can be determined by spectrophotometric nephelometric and turbidimetric methods.</p>

			<p><b>CO2:</b> Suggest the plausible structures and geometries of molecules using Radius Ratio Rules, VSEPR theory</p> <p><b>CO3:</b> To understand the concept of mechanism for a given reaction and also to know the importance of reaction intermediates.</p>
<b>OEC</b>	<b>21CH311</b>	<b>Fuel Chemistry and Environmental Chemistry</b>	<p><b>CO1:</b> Understand the concept of fuels, and their classifications.</p> <p><b>CO2:</b> Learn the different types of fuels and their applications.</p> <p><b>CO3:</b> Know the different types of pollution and their prevention.</p>
<b>DSC</b>	<b>21CH302</b>	<b>Content of Chemistry Lab-2</b>	<p><b>CO1:</b> Understand the importance of instrumental methods for quantitative applications Apply colorimetric methods for accurate determination of metal ions and anions in water or real samples</p> <p><b>CO2:</b> Able to evaluate acid- base titrations and generates the titration curves for strong acid and bases and also explain the reference and indicator electrodes.</p> <p><b>CO3:</b> Understand how functional groups in a compound is responsible for its characteristic property</p> <p><b>CO4:</b> Learn the importance of qualitative tests in identifying functional groups.</p> <p><b>CO5:</b> Learn how to prepare a derivative for particular functional groups and how to purify it.</p>
<b>DSC</b>	<b>21ZO301</b>	<b>Molecular Biology, Bioinstrumentation in Biology</b>	<p><b>CO1:</b> Gives an understanding of process of making an RNA copy of a gene's DNA sequence.</p> <p><b>CO2:</b> Through travel literature, people will learn about the life and culture of different regions</p> <p><b>CO3:</b> The study of ideological literature will lead to revolution.</p>
<b>OEC</b>	<b>21ZO311</b>	<b>ENDOCRINOLOGY</b>	<p><b>CO1:</b> Students will be able to classify hormones</p> <p><b>CO2:</b> It gives knowledge about mode of action and chemical structures of hormones</p> <p><b>CO3:</b> Students will be able to learn Gastro-intestinal hormones and their role in digestion</p>
<b>DSC</b>	<b>21ZO302</b>	<b>Practical's</b>	<p><b>CO1:</b> Knowledge about the use of laboratory equipments and sterilization techniques.</p> <p><b>CO2:</b> Gives general understanding of DNA handling techniques and isolation of genetic material.</p> <p><b>CO3:</b> It imparts knowledge about centrifugation techniques in separating components of given mixture.</p>

## Semester IV

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN401	Generic English-IV	<p>CO1: Acquired creative, interpretative and critical thinking</p> <p>CO2: Skills to communicate confidently and effectively</p> <p>CO3: Obtained persuasive and creative social media writing skills</p> <p>CO4: Developed analytical and evaluative skills</p> <p>CO5: Learnt to identify and understand social contexts and ethical frameworks in the texts</p>
AECC	21KA401	Kannada-IV	<p>CO 1: Learn to live in harmony by learning about the oppressed race.</p> <p>CO 2: students will live in tolerance with each other.</p> <p>CO 3: By understanding the life of common people, one will know the essence of simple life</p> <p>CO 4: Know the importance and various forms of Kannada Language</p>
AECC	21HI401	Hindi-III	<p>CO1: Able to understand Hindi Novels</p> <p>CO2: Able to understand the importance of Mass Media and Communication</p>
SEC-2		<b>Artificial Intelligence</b>	<p>CO1: To get introduce about the concept of artificial intelligence and machine learning.</p> <p>CO2: Understanding data analysis process i.e. preparation, modelling, visualization.</p> <p>CO3: It is to learn about the robotics, types of robots and also components of robots.</p>
DSC	21CH401	Fundamentals of chemistry - IV	<p>CO 1: Able to define chromatography and also know the steps involved in a chromatography investigation.</p> <p>CO 2: Predict the nature of the bond formed between different elements, Identify the possible type of arrangements of ions in ionic compounds.</p> <p>CO 3: To understand the concept of mechanism for a given reaction and also to know the importance of reaction intermediates,</p> <p>CO 4: Understand the concept of rate of a chemical reaction, integrated rate equations, energy of activation and determination of order of a reaction based on experimental data</p>



OEC	21CH411	Electrochemistry, Corrosion and Metallurgy	<p><b>CO 1:</b> Understand the concept of conductance in electrolytic solutions, electrolysis and redox reactions involved in electrode reactions.</p> <p><b>CO 2:</b> Able to understand the Different types of Batteries their principal construction and working, lead-acid storage and lithium-ion battery. Study of Fuels cells.</p> <p><b>CO 3:</b> Gain the knowledge of ores and minerals, extraction of metals and purification.</p>
DSC	21CH402	Content of Chemistry Lab-IV	<p><b>CO1:</b> Understand the chemical reactions involved in the detection of cations and anions.</p> <p><b>CO2:</b> Explain basic principles involved in classification of ions into groups in semi-micro qualitative analysis of salt mixture.</p> <p><b>CO 3:</b> Understand the use of instruments like conductivity meter to obtain various physicochemical parameters and also know the theory about chemical kinetics</p> <p><b>CO 4:</b> Learn to fit experimental data with theoretical models and interpret the data</p>
DSC	21ZO401	Gene Technology, Immunology and Computational Biology	<p><b>CO1:</b> Gives an understanding of the use of rDNA technology in cloning of commercially important plants and animals.</p> <p><b>CO2:</b> Gives an understanding of how different lymphocytes interact together to coordinate against disease causing foreign bodies.</p> <p><b>CO3:</b> It gives understanding of how transplantation is carried out in animals and difficulties faced in transplantation</p>
OEC	21ZO411	Animal behaviour	<p><b>CO1:</b> Animal behaviour helps students to learn how animals interact with each other and their surrounding environment</p> <p><b>CO2:</b> Students develop the skill of observation, which helps them to learn lessons from animals</p> <p><b>CO3:</b> Helps the students to understand Biological clocks and Biological rhythms in animals</p>
DSC	21ZO402	Practical's	<p><b>CO1:.</b> Helps students to understand common techniques used in biological sciences such as PAGE, Agarose gel electrophoresis, and determination of blood groups.</p> <p><b>CO2:</b> Students will be able to learn handling nucleotide sequence databases.</p> <p><b>CO3:</b> Helps students to quantify DNA and protein fragments.</p>