K.L.E Society's
Raja Lakhamagouda Science Institute (Autonomous), Belagavi

(PO's/PSO's/CO's)

Program: B. Sc. Physics & Statistics (UG01C04)

Programme Outcome

PO1: Disciplinary knowledge and skills: Capable of demonstrating comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Physics & Statistics 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 Physics & Statistics.

PO3: Sense of inquiry: Capability for asking relevant/appropriate questions relating to issues and problems in the field of Physics & Statistics, 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 Physics & Statistics on society and apply conceptual understanding of the Physics & Statistics 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 Physics & Statistics related job trades and employment opportunities.

Course Outcomes

Semester I

Course Type	Course Code	Course Title	Course Outcome
AECC	**21EN101**	**Generic English-I**	**CO1:** Learn to appreciate literary texts. **CO2:** Obtain the knowledge of literary devices and genres. **CO3:** Acquire the skills of creativity to express one's experiences. **CO4:** Be aware of their social responsibilities. **CO5:** Develop the critical thinking skills. **CO6:** Develop gender sensitivity. **CO7:** Increase reading speed, analytical skills and develop presentation skills. **CO8:** Become employable with requisite professional skills, ethics and values.
AECC	**21KA101**	**Kannada**	**CO 1**: Create appreciation for Kannada language and culture through Kannada literature **CO 2:** Creating environmental awareness. **CO 3:** Developing scientific perspective through science literature. **CO 4:** Know the importance and various forms of Kannada Language
AECC	**21HI101**	**Hindi**	**CO1:** Create interest among the students by reading story. **CO2:** Will be familiar with the development sequence of modern Hindi story. **CO3:** Interest towards linguistic correctness will be created. **CO4:** Will be able to acquire writing skills. **CO5:** Know the importance and various forms of Hindi Language.
SEC	**21CS111**	**Digital fluency**	**CO1:** 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. **CO2:** Develop holistically by learning essential skills such as effective communication, problem solving, design thinking, and team work. **CO3:** Build his or her personal brand has an agile and expensive learner- one who is interested in horizontal and vertical growth?

DSC	**21PH101**	**Mechanics and Properties of Matter**	**CO1:** Learn about conservation laws in different frames of reference **CO2:** Know how *g* can be determined experimentally and derive satisfaction. **CO3:** Come to know how various elastic moduli can be determined. **CO4:** Measure surface tension and viscosity and appreciate the methods adopted.
OEC	**21PH111**	**Energy Sources**	**CO1:** To understand the fundamental concepts of reflection, refraction and dispersion of Light. **CO2:** To explain the fundamentals of instruments based on optical phenomenon. **CO3:** To describe the working of optical components in various instruments. **CO4:** To explain the applications of various types of optical components in instruments.
DSC	**21PH102**	**Physics practical**	**CO1:** Will get hands on experience of different equipment. **CO2:** Will see the difference between simple and torsional pendulum and their use in the determination of various physical parameters. **CO3:** Will measure surface tension and viscosity and appreciate the methods adopted. **CO4:** Will know how g can be determined experimentally and derive satisfaction. **CO5:** Will measure Moment of Inertia of Fly wheel and verify perpendicular and parallel axis theorem for Circular disc.
DSC	**21PH101**	**Mechanics and Properties of Matter**	**CO1:** Learn about conservation laws in different frames of reference **CO2:** Know how *g* can be determined experimentally and derive satisfaction. **CO3:** Come to know how various elastic moduli can be determined. **CO4:** Measure surface tension and viscosity and appreciate the methods adopted.

DSC	**21ST101:**	**Descriptive Statistics**	**CO 1:** Acquire knowledge of introductory statistics, its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc. **CO2:** Get knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc. **CO3:** Perceive the knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations. **CO4:** Learn different of types of data reflecting independence and association between two or more attributes. **CO5:** Develop ability to critically assess a standard report having graphics, probability statements.
Practical	**21ST102:**	**Statistics Practical I**	**CO1:** Acquire knowledge of introductory statistics, its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc. **CO2:** Get knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc. **CO3:** Perceive the knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations. **CO4:** Learn different of types of data reflecting independence and association between two or more attributes. **CO5:** Develop ability to critically assess a standard report having graphics, probability statements.

Semester II

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN201	Generic English-II	**CO1:** Learn to appreciate literary texts. **CO2:** Obtain the knowledge of literary devices and genres. **CO3:** Acquire the skills of creativity to express one's experiences. **CO4:** Be aware of their social responsibilities.
AECC	21BO311	Environmental Studies	**CO1:** define environmental study and ecology with basic principles. **CO2:** To examine the natural recourses their types and utility. **CO3:** To identify the environmental usages, types of pollutions and their impact. **CO4**: To outline the diversity and explain the conservations and its significance.
AECC	21KA201	Kannada-II	**CO 1: A** good personality is formed by literature based on life values. **CO 2: Students** become ambitious to build a better life by achieving specific goals. **CO3:** Inspiring to always be enthusiastic in life. **CO4:** You will get complete knowledge of modern Kannada poetry.
AECC	21HI201	Hindi-II	**CO1:** Create interest among the students by reading story. **CO2:** Will be familiar with the development sequence of modern Hindi story. **CO3:** Interest towards linguistic correctness will be created. **CO4:** Will be able to acquire writing skills. **CO5:** Know the importance and various forms of Hindi Language.
DSC	21PH201	Physics	**CO1:** Know the vocabulary and concept of physics as it applies to Principal of Electric Field, Gauss's law Electric potential, Capacitance and Dielectrics, current and resistance, direct current circuits, Magnetic Fields, Source of Magnetic Fields, Faraday's Law, Inductance, Alternating current circuits and Electromagnetic waves **CO2:** Apply Gauss's law of electrostatics to solve a variety of problems. **CO3:** Describe the magnetic field produced by magnetic dipoles and electric currents. **CO4:** Explain gradient, curl & divergence concepts and Maxwell laws to articulate the relationship between electric and magnetic fields.
OEC	21PH211	OPTICAL INSTRUMENTS	**CO1:** To understand the fundamental concepts of reflection, refraction and dispersion of Light. **CO2:** To explain the fundamentals of instruments based on optical phenomenon. **CO3**: To describe the working of optical components in various instruments.

			CO4: To explain the applications of various types of optical components in instruments
DSC	21PH202	Physics practical	**CO1:** Will get hands on experience of different electrical equipment. **CO2:** Will have achieved the ability to Choosing testing and experimental procedures on different types of electrical circuit and analyze their operation with different operating conditions. **CO3:** Will learn fixing units, tabulation of observations, analysis of data (graphical/analytical) **CO4:** Apply knowledge of electricity and magnetism to explain natural physical processes and related technological advances.
DSC	21ST201	Probability and Distributions	**CO1:** Conceptualize the probabilities of events including frequents and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes theorem. **CO2:** Get knowledge related to concept of discrete and continuous random variables and their probability distribution including expectations and moments. **CO3:** Learn knowledge of important discrete and continuous distribution such as Binomial, Poisson, Normal distributions. **CO4:** Acquire knowledge on R-programming in the descriptive statistics and probability models.
DSC	21ST202	Statistics Practical II	**CO1:** Conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes theorem. **CO2:** Get knowledge related to concept of discrete and continuous random variables and their probability distribution including expectations and moments. **CO3:** Learn knowledge of important discrete and continuous distribution such as Binomial, Poisson, Normal distributions. **CO4:** Acquire knowledge on R-programming in the descriptive statistics and probability models.

Semester III

Course Type	Course Code	Course Title	Course Outcome
AECC	21EN301	Generic English-III	CO1: Acquired enhanced LSRW (Listening, Speaking, Reading, Writing) skills CO2: Equipped themselves with interpersonal communication skills CO3: Augmented presentation and analytical skills CO4: Ability to critically analyses, interpret and appreciate literary texts CO5: An awareness of social, cultural, religious and ethnic diversities
AECC	21KA301	Kannada-III	CO 1: By knowing about Bhakti Sahitya, you will have the quality of humanity. CO 2: Through travel literature, people will learn about the life and culture of different regions CO 3: The study of ideological literature will lead to revolution. CO 4: Know the importance and various forms of Kannada Language.
AECC	21HI301	Hindi-III	CO1: Able to understand One Act plays CO2: Learn to write various types of Letters
SEC-2		**Constitution of India**	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. CO2: To identify the importance of fundamental rights as well as fundamental duties. CO3: To understand the functioning of Union, State and Local Governments in Indian federal system.
DSC	21PH301	Physics-III	CO1: Give an analytical treatment of resonance in the case of open and closed pipes in general andHelmholtz resonators in particular. CO2: Describe the different parameters that affect the acoustics in a building, measure it and controlit. CO3: Give the Interference phenomenon and measure the parameters like the wavelength of light using experiments like Michelson interferometer,and thin films. CO4: Explain diffraction due to multiple slits, and polarization phenomenon using quarter and half wave plate.
DSC	21PH302	Physics practical	CO1: Improves the skill of handling optical equipments. CO2: Learns the calibration of Spectrometer

DSC	21ST301	Distribution Theory	CO1: Understand the axiomatic formulation of modern probability theory and think of random variables as an intrinsic need for the analysis of random phenomena. CO2: To fit probability distributions such as Negative binomial, Normal, to carry out large sample and small sample tests of significance. CO3: Find sampling distributions of functions of random variables applications. CO4: Able to learn different mathematical model and their application in simulation.
DSC	21ST 302	Practical's	CO1: Practical's on probability distribution used to describes the likelihood of obtaining the possible values that a random variable can assume. CO2: Probability distributions help to forecast power failures and network outages. CO3: Practical's on continuous distribution used if the variable can assume an infinite number of values between any two values. CO4: Probability distribution used widely in the study of large sample theory where normality is involved

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 CO 4: Know the importance and various forms of Kannada Language
AECC	21HI401	Hindi-III	CO1: Able to understand Hindi Novels CO2: Able to understand the importance of Mass Media and Communication
SEC-2		**Artificial Intelligence**	CO1: To get introduce 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	21PH401		CO1: Explain the laws of thermodynamics and analyze the thermal system CO2: Apply the laws of kinetic theory and radiation laws to the ideal and practical thermodynamicssystems through derived thermodynamic relations. CO3: Use the concepts of semiconductors to describe different Semiconductor devices such asdiode transistors, BJT, FET etc and explain their functioning. CO4: Describe the functioning of OP-AMPS and use them as the building blocks of logic gates.
DSC	21PH402	Practicals	CO1: Verifies the Stefan's law using black body radiation. CO2: Gives the practical knowledge about working of Operational amplifier
DSC	21ST401	Statistical Inference-I	CO1: Carryout statistical analysis by identifying families of distributions and the use of order statistics. CO2: To find estimators using different methods of estimation and compare estimators. CO3: To carry out statistical inference using different tests of hypotheses under different scenarios. CO4: Generate random variables and use this generated random variable for illustration of concepts studied in this course.
DSC	21ST 402	Statistics Practical IV	CO1: Practical's on statistical inference consists in the use of statistics to draw conclusions about some unknown aspect of a population based on a random sample from that population. CO2: Practical's on point estimation methods which consist of assigning a value to each unknown parameter. CO3: Regression models are the most commonly used method in medicine and the biological sciences to describe the relationship between an outcome variable and one or more exposure variables. CO4: Statistical inference is used to examine gene expression data across biological replicates to isolate significant changes, beyond what would be expected by random chance.