Kristu Jayanti College
AUTONOMOUS Bengaluru
Reaccredited 'A++' Grade by NAAC | Affiliated to Bengaluru North University

FACULTY OF SCIENCES

Programme Matrix: Bachelor of Science – Physics, Electronics [2023 Batch]

Programme Outcomes

After successful completion of B.Sc. honours in Physics and Electronics, a student will be able to:

PO1: integrate scientific temper; spirit of enquiry, humanism and reform

PO2: apply scientific knowledge and skills ethically for societal development and entrepreneurship

PO3: acquire systematic understanding of core area of classical mechanics, quantum mechanics, electromagnetic theory, electronics, optics, special theory of relativity and modern physics.

PO4: analyse physical problems and improve problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions using natural laws.

PO6: analyse the problems of the circuits by conducting experimental investigations.

PO7: design and develop the electronics circuits to meet the desired needs considering public health, safety and environmental considerations

Date of Approval: 10/2/23

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KRISTU JAYANTI COLLEGE AUTONOMOUS BENGALURU

Programme Matrix: Bachelor of Science – Physics, Electronics [2023 Batch]

I Semester			
Course Type	**Course Code**	**Course Title**	**Course Outcomes**
DSC	21PHY2T411	Mechanics and Properties of Matter	1. Learn about accuracy of measurement and sources of errors, importance of significant figures 2. Know how g can be determined experimentally and derive satisfaction 3. Understand the basics of Elasticity and its importance in beams, and girders 4. Acquire the knowledge of surface tension and viscosity and appreciate the methods adopted
DSC	21PHY2L211	Mechanics and Properties of Matter Practical	1. Calculate the elastic moduli of different materials 2. Set-up and perform experiments related to Viscosity and Surface tension 3. Design experiments to determine 'g' 4. Apply the workdone by variable force.
DSC	21ELE2T411	Electronic Devices and Circuits	1. Study and analyze basic networks using network theorems in a systematic manner 2. Describe the behavior of basic semiconductor devices 3. Construct simple voltage regulators used in various applications. 4. Design the circuit to understand the VI characteristics of diode/BJT devices 5. Measure the voltage gain of BJT amplifiers at different frequencies 6. Explain the behavior, characteristics and applications of Varactor diode, Schottky diode, Tunnel diode, LED, LCD and solar cells. 7. Apply standard device models to explain/calculate critical internal parameters of semiconductor devices.
DSC	21ELE2L211	Electronic Devices and Circuits Practical	1. Demonstration of the working of Multimeter, CRO and LCR meter. 2. Construct current and voltage-based circuit theorems. 3. Construct and understand the working of Transistor. 4. Construct and understand the working of Voltage regulators
AECC	22ENG1T312	Musings in English Literature	1. Articulate the relevant issues of society through the imbibed knowledge of prose 2. Identify and appreciate nuances of poetry 3. Implement the basic concepts of grammar and its usage.

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AECC	21KAN1T312	Saahithya Sangama I	1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ಸಾಮಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು. 2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು. 3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದ ಸೃಜನಶೀಲತೆಯ ಮಹತ್ವವನ್ನು ಚರ್ಚಿಸುವರು. 4: ಹದಿಹರೆಯ ವಯಸ್ಸಿನ ಸಮಸ್ಯೆಗಳು ಹಾಗೂ ಪರಿಹಾರಗಳನ್ನು ವಿಶ್ಲೇಷಿಸುವರು.
AECC	21HIN1T312	Hindi Kahani aur Prayajanmulak Hindi	1: हिन्दी कहानी विधा का ज्ञान ग्रहण करने की क्षमता का विकास। 2: विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास। 3: विद्यार्थियों में कहानी विधा का वर्णन करने की क्षमता का विकास। 4: विद्यार्थियों में कहानी का विश्लेषण और भाषा कौशल में प्रवीणता।
AECC	22AEN1T311	Listening and Comprehension in English	1. identify the barriers to listening and describe the key components that contribute to effective listening 2. use their grammatical knowledge to refine their speech and writing 3. analyse complex human situations and challenges that emerge from the prescribed texts.

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II Semester			
Course Type	**Course Code**	**Course Title**	**Course Outcomes**
DSC	21PHY2T421	Electricity and Magnetism	1. Understand the fundamental principles of electrostatics, able to employ methods of calculus to calculate electric field from a distribution of charges 2. Learn mathematical methods of Gauss' law to calculate electric field for problems involving symmetry 3. Acquire knowledge of magnetic field through the understanding of Ampere's law and apply it to compute the field in problems 4. Understand Biot-Savart law and use to compute the field due to current carrying conductors.
DSC	21PHY2L221	Electricity and Magnetism Practical	1. Design current and voltage theorem circuits. 2. Understand the concept of resonance and apply it to practical applications 3. Determine the figure of merit of instruments
DSC	21ELE2T421	Analog and Digital Electronics	1. Measure the VI characteristics of various JFET and MOSFET devices. 2. Perform experiments for studying the behavior of semiconductor devices 3. Measure various device parameters values from their VI characteristics. 4. Estimate the experimental data for better understanding the device behavior. 5. Understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions. 6. Apply standard device models to explain/calculate critical internal parameters of semiconductor devices. 7. analyze combinatorial and sequential circuits.
DSC	21ELE2L221	Analog and Digital Electronics Practical	1. Develop mathematical operational circuits with inverting and non-inverting amplifier 2. Design filters and oscillators electronic circuits using operational amplifier 3. Build the circuit with basic logic gates and universal gates 4. Design combinational and sequential circuits using logic gate 5. Develop the circuit with IC 555
AECC	22ENG1T322	Glimpses: Readings from English Literature	1. Identify the themes and relevant issues through the study of prose and poetry 2. Develop the skill to identify the pertinent themes and characters in the novel 3. Implement new approaches in speaking and writing skills.
AECC	21KAN1T322	Saahithya Sangama II	1: ಸಾಹಿತ್ಯದಲ್ಲಿ ವ್ಯಕ್ತವಾಗಿರುವ ಮಾನವೀಯ ಮೌಲ್ಯಗಳನ್ನು ಅರಿಯುವರು. 2: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ಸಾಮಾಜಿಕ ಮೌಲ್ಯಗಳನ್ನು ಅರಿಯುವರು. 3: ಯುದ್ಧದಿಂದಾಗುವ ಅನಾಹುತಗಳನ್ನು ಅರಿಯುವರು. 4: ಮಾನ್ಯವಿಲ್ಲದ ಜಾತಿ ಬೇಧಭಾವಗಳ ಬಗ್ಗೆ ಅರಿಯುವರು. 5: ಜೀವನ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು.

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AECC	21HIN1T322	Hindi Kavitha aur Anuvaad Koushal	1: हिन्दी कविता का विश्लेषण एवं समझने की योग्यता का विकास। 2: विद्यार्थियों में सामाजिक यथार्थ और मूल्यांकन करने का विकास। 3: कविता में वर्णित कथा का वर्णन एवं काव्य सृजन करने का विकास। 4: अनुवाद एवं भाषा कौशल में प्राविण्यता।
AECC	22AEN1T321	Conversation Practice in English	1. Identify the barriers to listening and describe the key components that contribute to effective listening 2. Use their grammatical knowledge to refine their speech and writing 3. Analyse complex human situations and challenges that emerge from the prescribed texts.
AECC	21EVS1T321	Environmental Studies	1. Understand the concept of Environment and ecosystems 2. Gain knowledge on various components controlling the stability of ecosystem 3. Understand the Policies and laws pertaining to the welfare of life forms.

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III Semester			
Course Type	**Course Code**	**Course Title**	**Course Outcomes**
DSC	21PHY2T431	Optics and Wavemotion	1. Acquire and understand the concepts of Wave optics 2. Apply the knowledge to analyse the interference and diffraction pattern and evaluate the functions of an optical instrument 3. Discuss the concepts of optical instruments and properties of laser 4. Illustrate the importance and applications of forced oscillations and resonance
DSC	21PHY2L231	Optics and Wavemotion Practical	1. Perform experiments to calculate optical and material parameters 2. Design optical experiments using spectrometer and lasers 3. Perform experiments to determine optical activity of different solutions
DSC	21ELE2T431	Digital Design Using Verilog and VHDL Programming	1. Identify different keywords, commands and operators used in Verilog and VHDL Language 2. Construct digital circuits using Verilog programming 3. Apply the knowledge of Verilog for modeling and functional verification of digital circuits 4. Apply the knowledge of VHDL for modeling and functional verification of Digital circuits. 5. Construct digital circuits using VHDL programming.
DSC	21ELE2L231	Digital Design Using Verilog and VHDL Programming Practical	1. Identify language elements and keywords used in Verilog and VHDL 2. Interpret Verilog programs in structural and dataflow modeling levels of Abstraction 3. Demonstrate Verilog programs in behavioural modeling levels of Abstraction 4. Compare VHDL programs in structural and dataflow modeling levels of Abstraction with Verilog program 5. Evaluate VHDL programs in behavioural modeling levels of Abstraction with Verilog program.
AECC	21ENG1T332	Symphony of English Literature	1. Identify the themes and relevant issues through the study of prose and poetry 2. Develop the skill to identify the pertinent themes and characters in the novel 3. Implement new approaches in speaking and writing skills.

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AECC	21KAN1T332	Saahithya Sangama III	1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ಸಾಮಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು. 2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು. 3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದ ವರ್ತಮಾನದ ಘಟನೆಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು. 4: ಹದಿಹರೆಯ ವಯಸ್ಸಿನಲ್ಲಿ ಅರಿಯಬೇಕಾಗಿರುವ ಶಾಂತಿ-ಸೌಹಾರ್ದತೆಯ ಕುರಿತು ವಿಶ್ಲೇಷಿಸುವರು. 5: ಜೀವನದಲ್ಲಿ ಮಾನವನು ಬೆಳೆಸಿಕೊಳ್ಳಬೇಕಾದ ಬಹುಮುಖ್ಯ ಆದರ್ಶ, ತತ್ವಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು.
AECC	21HIN1T332	Hindi Natak Sahitya aur Sanchar Maadhyam evam Hindi	1:हिन्दी नाटक विधा को समझना और अभिनय करने की योग्यता का विकास। 2:विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास। 3: नाटक लेखन और पठन में रूचि एवं सृजनात्मक कौशल्य का विकास। 4: संचार माध्यम कला में प्राविण्यता।
AECC	21AEN1T331	Essential English Reading	1. Recognize the techniques of effective reading and demonstrate their competence in comprehension. 2. Articulate their thoughts and structure written compositions as needed in official contexts 3. Formulate their responses to contemporary challenges that emerge from the prescribed texts.

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IV Semester			
Course Type	**Course Code**	**Course Title**	**Course Outcomes**
DSC	21PHY2T441	Heat and Thermodynamics	1. Understand the laws thermodynamics and thermodynamic processes 2. Acquire the knowledge about entropy 3. Analyse the different thermodynamic phases 4. Derive the Plank's law for black body radiation.
DSC	21PHY2L241	Heat and Thermodynamics Practical	1. Set up and perform experiments related to thermal conductivity 2. Adopt an understanding of thermodynamics principles to effectively solve mechanical problems in day-to-day life. 3. Determine temperature using simple thermoelectric materials.
DSC	21ELE2T441	Communication Systems	1. Describe the noise, transmission and radio wave propagation 2. Demonstrate analog modulation techniques-AM & FM 3. Explain AM & FM receiving function of analog modulation techniques 4. Illustrate the concept of resonant and non-resonant antennas 5. Summarize the block diagram of monochrome and colour televisions.
DSC	21ELE2L241	Communication Systems Practical	1. Experiment the working of preemphasis, deemphasis and crossover networks 2. Explain the elimination filters, mixers and multipliers 3. Demonstrate AM generators, AGC circuits, detectors 4. Construct modulator and IF amplifier circuits 5. Measure sensitivity, selectivity and fidelity property of radio receiver.
AECC	21ENG1T342	Ruminations of English Literature	1. Articulate the relevant social issues and thematic representation in prose and poetry 2. Analyse the characters, plot, setting and themes of novel 3. Acquire vital employability skills and employment opportunities with in-depth knowledge of writing skills.
AECC	21KAN1T342	Saahithya Sangama IV	1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ಸಾಮಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು. 2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು. 3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದಲ್ಲಿ ಧಾರ್ಮಿಕ ಸಹಿಷ್ಣುತೆಯ ಮಹತ್ವವನ್ನು ಚರ್ಚಿಸುವರು. 4: ಶ್ರೀಸಾಮಾನ್ಯನ ಬದುಕಿನ ಸಮಸ್ಯೆಗಳು, ಜವಣಿಗಳು ಹಾಗೂ ಪರಿಹಾರಗಳನ್ನು ವಿಶ್ಲೇಷಿಸುವರು. 5: ದಮನಿತ ಲೋಕದ ಶೋಷಣೆಯ ಭಿನ್ನ ರೂಪಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು.

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AECC	21HIN1T342	Hindi Laghu Upanyas aur Bhasha Ke Vividh Roop	1: हिंदी उपन्यासों का ज्ञान ग्रहण और समझने की योग्यता का विकास। 2: विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास । 3: लघु उपन्यास की कथा का वर्णन और विश्लेषण करने की क्षमता का विकास। 4: भाषा के विविध रूपों एवं भाषा कौशल में प्राविण्यता।
AECC	21AEN1T341	Fundamentals of English Written Communication	1. Examine the features of effective writing and demonstrate their skills in complex, non-formulaic writing 2. Identify and fix common stylistic errors in written English 3. Analyze the representation of cross-cutting issues in literary works.
AECC	21INC1T341	India and Indian Constitution	1. Evaluate the philosophy of the Constitution and its structure 2. Appraise the powers and functions of various offices under the Constitution 3. Analyze the Indian values, Ideals and the role of Constitution in a Democracy.

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