PARAMEKKAVU COLLEGE OF ARTS AND SCIENCE
Affiliated to University of Calicut, U.O.No. 2436/2013/CU
(Managed by Sree Paramekkavu Educational, Cultural and Charitable Trust)
MLA Road, Punkunnam, Thrissur 680 002. Ph : 0487 2960800, 9961068618
E-mail : paramekkavucas@yahoo.in, Website : www.paramekkavuartsandsciencecollege.com

PARAMEKKAVU COLLEGE OF ARTS AND SCIENCE

COURSE OUTCOME, PROGRAMME OUTCOME, PROGRAMME SPECIFIC OUTCOME, PROGRAMME EDUCATIONAL OBJECTIVES

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DEPARTMENT OF ELECTRONICS

BACHELOR OF SCIENCE IN ELECTRONICS

PROGRAMME OUTCOME:

PO1	Acquire the ability to apply the basic principles of logic and science to thoughts, actions and interventions.
PO2	Perceive knowledge as a comprehensive, interrelated and integrated faculty of the human mind.
PO3	Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.
PO4	Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
PO5	Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.
PO6	Participate in nation building by adhering to the principles of scientific temper, sovereignty, socialism, secularism, democracy and the values that guide a republic.
PO7	Develop gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalization.
PO8	Understand the issues related to the current environmental problems and apply the principles of science for a sustainable development in an interdisciplinary manner.
PO9	Develop communication skill in English and local languages through different media.
PO10	Learn to articulate analysis, synthesis, and evaluation of situations and themes in a scientific manner.

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PROGRAMME SPECIFIC OUTCOME: (B.SC. ELECTRONICS)

PSO1	Understand the basic principles of program development by identifying and formulating problems and integrate resources to decisions using the problem-solving approach
PSO2	Understand data-based reasoning through translation of data into abstract concepts using computing technology-based tools and develop real life applications
PSO3	Understand and recognize different value system and the moral dimensions of software development and applications and their outcomes and accept the responsibility for them
PSO4	Design web applications by understanding the global perspective .and make meaning of the world by connecting people ideas, media and technology.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1	Technical knowledge and skills in electronics.
PEO2	Problem-solving abilities using engineering principles.
PEO3	Design and implementation of electronic systems.
PEO4	Commitment to lifelong learning and career development

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COURSE OUTCOMES: B.SC. ELECTRONICS

Core/Common/ Complimentary	Course Code & Name of Course,	Course Outcomes
Semester 1		
Core	ELE1B01 - Basic Electronics and Network Theorems	1. Understand basic electronic concepts and components, including voltage, current, resistance, and passive components.
		2. Apply fundamental circuit theorems and laws (KVL, KCL, Thevenin, Norton) for analyzing electrical circuits.
		3. Understand the properties and behavior of semiconductors, including PN junction diodes and special diodes.
		4. Comprehend the operation and characteristics of BJTs, FETs, UJTs, and SCRs.
Complementary	ELE1C01 - Electronic Devices	1. Identify and classify electronic components, including resistors, capacitors, and inductors.
		2. Explain the operation of light-sensitive devices like LDRs, LEDs, and LCDs.
		3. Understand semiconductor fundamentals and diode operations, including PN junction and zener diodes
		4. Explain the operation of light-sensitive devices like LDRs, LEDs, and LCDs.
		5. Analyse BJT configurations, characteristics, and use transistors as switches.
Semester 2		
Core	ELE2B02- Electronic Circuits	1. To equip the students with basic components in electronics, identifying and testing them
		2. To learn fundamentals of electronics
		3. To learn the circuit assembling

		4. To study circuit troubleshooting
		5. To equip the students with basic components in electronics, identifying and testing them
Complementary	ELE2C02 – Electronics Circuit	1. Design rectifier circuits and voltage regulators, ensuring efficient power conversion and stable output.
		2. Analyze and design BJT biasing circuits and amplifiers, optimizing for desired performance metrics like gain and stability.
		3. Evaluate feedback amplifier configurations and design power amplifiers, considering efficiency and distortion characteristics.
		4. Design and troubleshoot oscillator circuits and utilize timer ICs for precise timing applications, ensuring reliable operation and functionality.
Semester 3		
Core	ELE3B05 – Digital Electronics	1. Master number systems, digital codes, Boolean algebra, and logic gates
		2. Analyze TTL, CMOS, ECL logic families; design combinational circuits.
		3. Implement multiplexers, flip-flops, shift registers, and popular IC applications.
		4. Design counters, understand IC applications, and ADC/DAC principles.
		5. Master number systems, digital codes, Boolean algebra, and logic gates
Complementary	ELE3C04 – Digital Electronics	1. Gain proficiency in converting between number systems and codes, performing arithmetic operations, and analysing logic gates using Boolean algebra
		2. Design and implement combinational logic circuits

		using SOP, POS, and Karnaugh map minimization techniques. Implement multiplexers, demultiplexers, adders, subtractors, encoders, and decoders.
		3. Design and construct sequential logic circuits including various flip-flops (S-R, J K, T, D), registers, counters (synchronous and asynchronous), and shift registers.
		4. Understand the operation and application of different types of memories (ROM, RAM - static and dynamic, PROM, EPROM, EEPROM, EAPROM) in digital systems.
		5. Analyse BJT configurations, characteristics, and use transistors as switches.
Common	A11– Python Programming	1. Understand various statements, data types and functions in Python
		2. Develop programs in Python programming language
		3. Understand the basics of Object-oriented programming using Python
		4. To know about backend processing.
Common	A12-Sensors and Transducers	1. Explain resistance, inductance and capacitance transducers.
		2. Perceive the concepts of temperature transducers.
		3. Perceive the concepts of level transducers and pressure transducers
		4. Explain flow transducers, electromagnetic transducers, radiation sensors and sound transducers

Common	A14 Sensors Transducers	1. Explain resistance, inductance and capacitance transducers. 2. Perceive the concepts of temperature transducers. 3. Perceive the concepts of level transducers and pressure transducers 4. Explain flow transducers, electromagnetic transducers, radiation sensors and sound transducers
Semester 4		
Core	ELE4B06 – Analog Integrated Circuits	1. Understand operational amplifier configurations and applications. 2. Design and analyze filters and waveform generators. 3. Utilize comparators and Timer 555 in various applications. 4. Comprehend VCO, PLL, and voltage regulators' operation and applications.
Complementary	ELE4C05 – Communication Electronics	1. Explain basic electronic communication systems and amplitude modulation (AM) principles. 2. Understand frequency and phase 3. modulation, and compare AM, FM, and PM. 4. Describe pulse analog modulation techniques and pulse code modulation (PCM). 5. Analyze digital carrier modulation techniques, including ASK, FSK, PSK, BPSK, and QPSK.
Common	A14 - Microprocessors Architecture and Programming	1. To understand digital logic fundamentals, including logic gates, Boolean algebra, combinational circuits, and arithmetic operations, enabling students to design. 2. To knowledge to analyze and design sequential circuits using various flip-flops, registers, and

		counters for applications requiring memory and state manipulation.
		3. To know about fundamental of a computer, instructions sets, registers, and control mechanisms, enabling you to understand how programs are executed and interact with memory, and interrupts.
		4. The control unit's design using microprogramming, explain organization with various register structures, instruction formats, and addressing modes, and get know about how instructions are fetched, decoded, and executed.
		5. To about the advanced memory management techniques, explore various I/O interfaces and data transfer protocols, and to understand how data efficiently flows between the processor, memory, and peripheral devices.
Common	A13 – Data Communication & Optical Fibers	1. Understand digital and analogsignal characteristics, transmission, and processing principles
		2. Understand the basics and principles of multiplexing in communication systems.
		3. Understand the role of DLC in ensuring reliable data transmission within communication networks.
		4. Understand fundamentals of optical fiber communication and identify and explain optical sources and detectors.
Semester 5		
Core	ELE5B10 – Electromagnetic Theory	1. Apply vector operations, theorems, and transformations in diverse mathematical contexts.
		2. Analysed solve electrostatic problems using Gauss's law and boundary conditions.

		3. Evaluate magnetic fields, currents, and their interactions using appropriate physical laws.
		4. Understand Maxwell's equations, wave propagation, and antenna fundamentals comprehensively
Core	ELE5B11 – Microcontroller & Interfacing	1. Understand the architecture and internal organization of the 8051 microcontrollers.
		2. Master the 8051instruction set and addressing modes for efficient programming.
		3. Implement and manage timers, counters, and various interrupts in the 8051 microcontrollers.
		4. Develop and debug embedded applications using Arduino and its IDE, interfacing various sensors and peripherals.
Core	ELE5B12 - Network Theory	1. To Apply Ohm's Law, Kirchhoff's Laws (Voltage and Current Laws), and other basic circuit laws for analysis.
		2. Analyzing transient responses to various input signals and predicting and interpreting steady-state behavior.
		3. To equip students with the theoretical knowledge, analytical skills, and practical experience necessary to understand, analyze, and design AC circuits effectively.
		4. Analyze, design, and utilize series and parallel RLC circuits for resonance applications, as well as to understand and implement various types of filters in electronic systems.
Semester 6		
Core	ELE6B13 – Communication System	1. Understand AM spectrum, power relations, and AM generation methods like DSBSC and SSB.
		2. Study FM theory, noise considerations, and generation/detection methods using direct and indirect methods.

		3. Explore radio receiver types (TRF, superheterodyne), propagation phenomena (ground wave, ionospheric), and receiver performance factors.
		4. Learn PAM, PWM, PPM, TDM, FDM, CDMA, and digital modulation techniques.
Core	ELE6B14 – Principles of DSP	1. Understand various types of signals and their math Fourier, and Z transforms.
		2. Classify systems and comprehend their properties, transfer functions, and convolution methods.
		3. Understand and compute the DFT and its relationship with the Z transform, including FFT algorithms.
		4. Design and realize digital filters (FIR and IIR) and understand their properties and implementations.
Core	ELE6B15 - Microwave Theory and Techniques	1. To equip the students with basic understanding of Microwave theory and techniques
		2. Learn about microwave components like waveguides, antennas, and transmission lines.
		3. To equip students with the theoretical knowledge, analytical skills, and practical experience necessary to understand, analyze, and design AC circuits effectively.
		4. Analyze, design, and utilize series and parallel RLC circuits for resonance applications, as well as to understand and implement various types of filters in electronic systems.
Elective	ELE6B16a – Optical Communication	1. Explain optical communication principles and fiber characteristics, including critical angle and TIR.
		2. Understand signal degradation mechanisms in optical fibers and bandwidth limitations.
		3. Describe optical fiber couplers, splicing techniques, and point-to-point transmission systems.

		4. Analyze optical sources, detectors, and amplifiers, including LEDs, lasers, and photodiodes.