SRI KRISHNA INSTITUTE OF TECHNOLOGY
(Accredited by NAAC, Approved by A.I.C.T.E. New Delhi, Recognised by Govt. of Karnataka & Affiliated to V.T U., Belagavi)
#57, Chimney Hills, Hesaraghatta Main Road, Chikkabanavara Post, Bengaluru- 560090

Department of Electronics Engineering- VLSI Design and Technology

Course Outcomes – 2022 Scheme

Course Name	Course Code	Course Outcome No	Course Outcome
AV Mathematics-III for EC Engineering	BMATEC301	CO1	Apply the knowledge of calculus to solve problems related to polar curves & basics of partial differentiation to solve multivariate functions
		CO2	Analyze the solution of linear and nonlinear ordinary differential equations and make use the concept of PDE.
		CO3	Apply modular arithmetic to computer algorithms.
		CO4	Apply matrix theory for solving non-homogenous equations and compute eigen values and eigenvectors.
		CO5	Familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB/ PYTHON/ SCILAB.
Analog Electronics Circuits	BVL302	CO1	Understand the biasing and small signal analysis of BJT and MOSFET amplifier circuits.
		CO2	Outline the feedback topologies, output stages and power amplifiers.
		CO3	Design the MOSFET amplifiers and oscillators.
		CO4	Construct various Op Amp circuits such as negative feedback amplifiers, DAC, ADC, filters and 555 timer applications
Digital Logic Circuits	BVL303	CO1	Understand the basic concept of Combinational and Sequential circuits
		CO2	Apply the knowledge of different technique to realize the digital logic circuits.
		CO3	Design of digital logic circuits.

		CO4	Develop simple application using digital logic circuits.
Verilog HDL	BVL304	CO1	Understand the evolution, structure, and modelling concepts of Verilog HDL used in digital system design.
		CO2	Apply various Verilog modelling styles including gate-level, dataflow, and behavioural modelling techniques.
		CO3	Analyze the difference between procedural constructs like tasks and functions and illustrate their usage in modelling.
		CO4	Describe useful Verilog modelling techniques and the HDL synthesis flow for digital logic verification.
Computer Organization and Architecture	BVL306C	CO1	Understand the organization and architecture of computer systems with machine instructions and programs
		CO2	Summarize the input/output devices communicating with computer system
		CO3	Illustrate the organization of different types of semiconductors and other secondary storage memories.
		CO4	Apply appropriate data types in arithmetic and logical operations and examine basic processing unit functions including pipelining and parallel processing
Verilog HDL Lab	BVLL305	CO1	Apply Verilog HDL concepts to construct sequential and combinational circuits.
		CO2	Analyze the Simulated waveform for combinational and sequential circuits using EDA tool.
IOT LAB	BVL358D	CO1	Understand internet of Things and its hardware and software components
		CO2	Interface I/O devices, sensors & communication module
		CO3	Remotely monitor data and control devices
		CO4	Develop real life IoT based projects
FPGA Based system design using Verilog	BVL401	CO1	Understand the concept of programmable logic devices to implement digital circuits.
		CO2	Implementation of advanced digital circuits using FPGAs

		CO3	Characterize complex digital circuits using SM charts.
		CO4	Outline the floating -point arithmetic operations and its applications
Principles of Communication System	BVL402	CO1	Understand random variables, random processes, and noise in communication systems.
		CO2	Illustrate different types of analog modulation and demodulation techniques in communication systems.
		CO3	Apply sampling, quantization, encoding, and multiplexing in digital communication.
		CO4	Utilize baseband transmission principles and SNR concepts in communication systems
Control Systems	BVL403	CO1	Utilize mathematical modeling to determine the transfer function of a Control system.
		CO2	Apply block diagram reduction and signal flow graph methods to obtain transfer function of a Control system
		CO3	Analyze the behavior of 1st and 2nd order systems in time domain .
		CO4	Examine the stability of the system using time & Frequency domain techniques
FPGA Based System Design Using Verilog Lab	BVLL404	CO1	Understand the EDA tool to write HDL program
		CO2	Implementation of Combinational and Sequential Circuits using EDA tool
		CO3	Apply Verilog HDL concepts to interface programs with FPGA device
MICROCONTROLLERS	BVL405A	CO1	Understand the Architecture of 8051 Microcontroller and comparing with different processor Architecture.
		CO2	Apply the concepts of 8051 Microcontroller Addressing modes & Instructions to write Assembly Language Programs.
		CO3	Illustrate the operation of Timers/Counters for interrupt programming
		CO4	Develop C programs to interface I/O devices with 8051 Microcontroller.

Microcontroller Lab	BVL456A	CO1	Write a Assembly Language/C programing 8051 for solving simple problems that manipulate input data using different instructions.
		CO2	Construct experimental procedures for the 8051 Microcontroller and their operation under different conditions.
		CO3	Develop Microcontroller applications using external hardware interface.
Technological Innovation and Management	BVL501	CO1	Understand the key functions of management and foundational principles of entrepreneurship.
		CO2	Discuss the importance of small-scale industries, entrepreneurial development cycles & impact of government policies on entrepreneurship.
		CO3	Interpret the process of idea generation and feasibility analysis to identify viable business opportunities.
		CO4	Develop a simple business model & prepare a basic business plan including financial, marking and operational components.
Digital Signal Processing	BVL502	CO1	Identify different types of signals and systems used in DSP.
		CO2	Apply frequency transformation method to discrete time systems.
		CO3	Compute DFT and IDFT using fast and efficient algorithms.
		CO4	Design digital FIR and IIR filters for given specifications..
Digital VLSI Design	BVL503	CO1	Analyze the geometrical effects of MOS transistors using the fundamentals of semiconductor physics in MOS transistors
		CO2	Develop combinational, sequential digital circuits in CMOS logic.
		CO3	Analyze the synchronous timing metrics for sequential designs and structured design basics.
		CO4	Construct digital blocks with design constraints such as propagation delay and dynamic power dissipation.
		CO5	Design of Sequential circuits and memory circuits

Digital VLSI Laboratory	BVLL504	CO1	Simulate the combinational and sequential digital circuits using EDA tool
		CO2	Utilize the process of synthesis to obtain gate level netlist of ASIC design flow.
		CO3	Design the Schematic of basic CMOS circuits using EDA tools
Research Methodology and IPR	BRMK557	CO1	Understand the basic concepts, objectives, and types of engineering research.
		CO2	Outline the methods for technical reading, literature review, and the use of bibliographic databases.
		CO3	Articulate the fundamentals of intellectual property rights including patents, copyrights, and trademarks, and their relevance to engineering.
		CO4	Apply the knowledge of patent filing procedures for the steps involved in protecting innovations legally.
		CO5	Identify the processes related to industrial designs and geographical indications with reference to real-world case studies.
VLSI Fabrication Technology	BVL515D	CO1	Understands the basic steps of MOS transistor fabrication
		CO2	Learn the basics theory of crystal Growth and wafer preparation
		CO3	Students understands the concepts of Epitaxy. Diffusion, Oxidation, Lithography and Eching .
		CO4	Understands the process of film deposition and metallization in chip manufacturing.
Environmental Studies	BESK508	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
		CO2	Understand and Develop critical thinking /or observation skills and apply them to the analysis of a problem or question related to the environment as legislation.
		CO3	Apply their ecological knowledge to illustrate and grasp the problem and describe the realities that managers face when dealing with complex issues.

Embedded System Design	BEC601	CO1	Understand the basic hardware component and their selection method based on the characteristics and attributes of an embedded system
		CO2	Illustrate the need of real time operating system for embedded system applications
		CO3	Summarize the hardware software co-design and firmware design approaches
		CO4	Understand the architectural features and instructions of 32-bit microcontroller ARM Cortex M3
		CO5	Apply the knowledge gained for programming ARM cortex M3 for different applications
Analog and Mixed Signal Integrated Circuit Design	BVL602	CO1	**Understand** the operation of MOS transistors as switches, diodes, resistors, current sources, and the functioning of basic, Cascode, and Wilson current mirror circuits.
		CO2	**Develop** single-stage MOS amplifiers including common-source amplifiers with various loads and source follower configurations using their performance characteristics
		CO3	**Design** CMOS amplifier circuits such as active-load inverters, differential amplifiers, Cascode amplifiers, current amplifiers, and output amplifiers to meet given specifications.
		CO4	**Apply** the principles, architecture, and applications of operational amplifiers, oscillators, phase-locked loops, and data converters (ADC and DAC).
Low Power VLSI Design	BVL613A	CO1	**Understand** the impact of low power on system performance
		CO2	**Identify** the mechanisms of power dissipation in digital IC systems.

		CO3	**Apply** different circuit techniques to manage the low power
		CO4	**Analyze** the functionality of Low- voltage low -power memories
Operating Systems	BCS654B	CO1	Explain the fundamental concepts of operating systems, including OS objectives, structures, system calls, and services.
		CO2	Analyze process management concepts such as process states, CPU scheduling, inter-process communication, and synchronization mechanisms to handle concurrency issues.
		CO3	Apply memory management techniques and file system concepts, including allocation strategies and directory structures, to solve practical computing problems.
Indian Knowledge System	BIKS609	CO1	Provide an overview of the concept of the Indian Knowledge System and its importance
		CO2	Appreciate the need and importance of protecting traditional knowledge.
		CO3	Recognize the relevance of Traditional knowledge in different domains
		CO4	Establish the significance of Indian Knowledge systems in the contemporary world
Analog and Mixed Signal IC Design Lab	BVLL 606	CO1	**Demonstrate** the Characterization of the basic MOS.
		CO2	**Design** basic CMOS circuits like inverter, NOR gate with the post layout functionality check.
		CO3	**Analyze** Analog, Digital and Mixed mode circuits
		CO4	**Illustrate** the various issues in Mixed signal designs, basically data converters.