Viswambhara Educational Society

VAAGDEVI COLLEGE OF ENGINEERING

UGC-Autonomous

Department of Electronics and Communication Engineering

Course Outcomes for M.Tech – VLSI System Design (R15) for the academic year 2015-16 onwards

Course Outcome	**Year/Semester I/I Sem**	**Subject Name (Subject Code) VLSI TECHNOLOGY (A957101)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Build circuits using IC's.		
2	In depth knowledge of applying the concepts in real time applications.		
3	Understand the main elements of hierarchical IC design namely interested circuit technology, approaches to system design, architectural issues, design implementation and layout.		
4	Make the significant use of knowledge of subject in research or on project in VLSI domain.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) CMOS ANALOG INTEGRATED CIRCUIT DESIGN (A957102)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Define the parameters of MOS Devices & can predict the performance or behavior of Analog VLSI circuit.		
2	Use mathematical models of MOS transistors to evaluate their behavior in analog circuits.		
3	Investigate various analog IC performance parameters.		
4	Analyze & characterize analog devices and systems.		
5	Designing CMOS analog circuits to achieve performance specifications.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) CMOS DIGITAL INTEGRATED CIRCUIT DESIGN (A957103)**	**L: 4 P: 0 C: 4**
1	Define the basic of CMOS technology		
2	Relate, compare, interpret and make the use of the best CMOS design techniques for implementation, analysis & design of Combinational MOS logic circuits		
3	Know & tell different types of memories and compare performance evaluation of each memory modules so they can be able to think & justify how to improve performance by taking different structures.		
4	Define, simplify & justify which dynamic logic circuit can be used investigate CMOS circuits.		
5	Recommend various CMOS techniques and also other device technologies based on circuit constraints requirement.		
Course	**Year / semester**	**Subject Name (Subject Code)**	**L: 4 P: 0 C: 4**

Outcome	**I/I Sem**	**DIGITAL SYSTEM DESIGN (A957104)**	
After the completion of this course, the students should be able to			
1	Design and optimize combinational, sequential and arithmetic digital circuits.		
2	Identify & resolve the different testing issues, races, cycles and hazards in digital circuits.		
3	Apply knowledge of test pattern generation and Design for testability techniques for testing of digital systems.		
4	Understand Fault Diagnosis in Sequential Circuits.		
5	Make significant contribution in the research in based digital system design.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) HARDWARE AND SOFTWARE CO DESIGN (A957105)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Define a concurrent specification from an algorithm, analyze its behavior and partition the specification into software and hardware components.		
2	Describe the broad range of system architectures that currently exist and define their fundamental attributes including speed, energy, area, design complexity, design cost, etc.		
3	Describe the hardware and software co-design issues in embedded system.		
4	Make significant contribution in the research in based on hardware-software co-design		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) CPLD AND FPGA ARCHITECTURES AND APPLICATIONS (A957106)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Explain the architecture of Programmable Logic Devices.		
2	Explain the architecture of FPGA & Actel FPGA family ·		
3	Describe the architecture of the Xilinx Virtex FPGA family		
4	Choose the appropriate FPGA/ CPLD architecture for given a specific application.		
5	Make significant contribution in the research in applications based on CPLD & FPGA architectures.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) ALGORITHMS FOR VLSI DESIGN AUTOMATION (A957107)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Describe and formulate the flow of VLSI Design for any application.		
2	Explain the algorithms for partitioning, floor planning, placement and routing the		

	digital designs at frontend level & at backend VLSI Design level.			
3	Compare the various scheduling algorithms and Analyze & solve the issues related to logic synthesis & verification.			
4	Simulate and Analyze the VLSI Circuits & Explain the algorithms for partitioning, floor planning, placement and routing the MCM modules.			
5	Make significant contribution in the research in based on design of CAD tool for VLSI design.			
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) EMBEDDED SYSTEM DESIGN** (A957108)	**L: 4 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Know the Basic Concept of Embedded Systems			
2	Interpret the difference between Microcontrollers and Microprocessors.			
3	Apply the Software for Embedded System Design & Embedded OS.			
4	Explain and apply the concept of Embedded Firmware, RTOS Based Embedded System Design and Task function.			
5	Make significant contribution in the research in applications based on embedded system design.			
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) DEVICE MODELLING (A957109)**	**L: 4 P: 0 C: 4**	
After the completion of this course, the students should be able to				
1	Understand the physics and design elements of silicon MOSFETs.			
2	Explain the equations, approximations and techniques available for deriving a model with specified properties, for a general device characteristic with known qualitative theory.			
3	Analyze the performance issues & inherent trade off involved in system design Offer clues to qualitative understanding of the physics of a new device and conversion of this understanding into equations.			
4	Utilize semiconductor models to analyze carrier densities and carrier transport & basic governing equations to analyze semiconductor devices.			
5	Understand and analyze the inner working of semiconductor p-n diodes, Schottky barrier diodes and advanced MOSFET technology.			
6	Simulate characteristics of a simple device using MATLAB, SPICE and SYNOPSYS.			
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) SOFT COMPUTING TECHNIQUES (A957110)**	**L: 4 P: 0 C: 4**	
After the completion of this course, the students should be able to				
1	Understand importance of soft computing & different soft computing techniques			

	like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination		
2	Implement algorithms based on soft computing & Apply soft computing techniques to solve engineering or real life problems.		
3	Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.		
4	Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.		
5	Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) IMAGE AND VIDEO PROCESSING (A957111)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Understand the basics of digital image processing & video processing.		
2	Understand and analyze algorithms for digital image & video processing.		
3	Understanding of the principals the Digital Image Processing terminology used to describe features of images & Image Enhancement in the Spatial Domain.		
4	Understand the Image Restoration, Compression, Segmentation, Recognition, Representation and Description.		
5	Make significant contribution in the research in digital image & video processing domain.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) SOFTWARE DEFINED RADIO (A957112)**	**L:4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Understand the basic of software defined radio communication.		
2	Make system-level decisions for software-defined radio technology and products.		
3	Understanding Radio Resource Management in Heterogeneous Networks & Reconfiguration of the Network Elements.		
4	Design modern wireless system such as systems based on OFDM.		
5	Gain Knowledge of digital hardware architectures and understanding of development methods & ADC and DAC technology.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) VLSI LAB (A957113)**	**L: 0 P:4 C: 2**
After the completion of this course, the students should be able to			
1	Design, implement, and simulate circuits using HDL & Learns the frontend VLSI design by using HDL Foundation tools and Hardware Description Language.		
2	Analyze the results of logic and timing simulations and to use these simulation		

	results to debug digital systems.		
3	Understand circuit optimization with respect to area, performance and/or power at circuit level, layout level or at RTL level.		
4	Learns Logic synthesis, Simulation and verification steps in VLSI design & able to Understand circuit optimization with respect to area, performance and/or power at circuit level, layout level or at RTL level.		
5	Understand layout design rules & able to Simulate circuits within a CAD tool and compare to design specifications.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code) SEMINAR (A957114)**	**L: 0 P:4 C: 2**
After the completion of this course, the students should be able to			
1	Learn various gestures of oral presentation		
2	Improve the personal strength		
3	Acquire new skills of presentation		
4	Overcome stage fears		
5	Gain technical knowledge		
6	Implement various tools and aids in teaching.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) LOW POWER VLSI DESIGN (A957201)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	To design Low power CMOS designs, for digital circuits & gains knowledge on low power circuit design styles for VLSI circuits.		
2	To understand power estimation and optimization methods for VLSI circuits & causes of the power dissipation in digital ICs. Quantitative analysis of power dissipation in VLSI circuits		
3	Exploring the low power circuits and architectures for VLSI system.		
4	To understand the concept of VLSI circuit of low power operation & case study of low power design.		
5	To design various circuits for optimize power.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) DESIGN FOR TESTABILITY (A957202)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Understand advanced digital testing algorithms.		
2	Use the appropriate test algorithm methods for achieving digital certain fault coverage specifications in design.		
3	Use the fault tolerant methods to increase the reliability (fault tolerance) for system design.		

4	Understand the fundamentals of reliability concepts, accelerated tests such as burn-in, temp cycling and HAST.		
5	Understand different techniques in Built In Self Test (BIST) such as MBIST and LBIST & apply test techniques such as Iddq test, at speed test and delay tests.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) CMOS MIXED CIRCUIT SIGNAL DESIGN (A957203)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Build mixed signal circuits like DAC, ADC, PLL etc. & gains knowledge on filter design in mixed signal mode & different architectures in mixed signal mode.		
2	This Mixed Signal processing course provides comprehensive techniques on the essential concepts of Mixed Signal Testing. This information is designed to elevate the baseline understanding and capabilities of product/test engineers.		
3	This subject introduces digital test and linear test engineers to the mixed signal world by teaching the basics of analog and mixed signal test methods. Sampling Theory, Frequency Domain Testing, and Digital Signal Processing.		
4	The course applies these fundamental concepts to different test methods and data validation for mixed signal parameters together with debugging, noise reduction and device interface techniques.		
5	Able to Design of core mixed-signal IC blocks: comparators and data converters.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) VLSI AND DSP ARCHITECTURE (A957204)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Learn to represent real world signals in digital format and understand transform-domain (Fourier and z-transforms) representation of the signals.		
2	Apply the linear systems approach to signal processing problems using high-level programming language.		
3	Undersatnds the basic architecture of microprocessors and digital signal processors.		
4	Learn to implement linear filters in real-time DSP chips.		
5	Applies linear filters and their real-time implementation challenges.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) ASIC DESIGN(A957205)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	To learn the fundamentals of ASIC and its design methods & gains knowledge on programmable architectures for ASICs		
2	To understand the physical design of ASIC.		
3	To prepare the student to be an entry level industrial standard cell ASIC or FPGA designer.		

4	To give the student an understanding of issues and tools related to ASIC/FPGA design.		
5	Prepare the student for implementation, including timing, performance and power optimization, verification and manufacturing test.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) HARDWARE DESCRIPTION LANGUAGE (A957206)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Understanding of behavioral, register-transfer, and structural/gate level HDL based digital system design capture, modeling, simulation, and synthesis/implementation processes and their impact on digital system design and manufacturing processes.		
2	Understanding of programmable logic implementation media, programming techniques, and architectures and their impact on digital system design, synthesis, implementation, testing, and manufacturing processes.		
3	Develop behavioral, register-transfer, and structural/gate level HDL models of digital circuits/systems and verify/debug those models through HDL simulations.The ability to synthesize behavioral, register-transfer, and structural/gate level HDL models and to implement and experimentally test the resultant design in programmable logic devices.		
4	Hands-on experience with Computer-Aided Design (CAD) tools for HDL design capture, design functional and performance validation/verification via HDL simulation testing, and synthesis/implementation of HDL models as well as tools for generating configuration data, programming, and testing the target programmable logic devices.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) OPTIMIZATION TECHNIQUES IN VLSI DESIGN (A957207)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Gain knowledge on Optimization techniques involved in VLSI circuits.		
2	Introduce methods of optimization to engineering students, including linear programming, nonlinear programming, and heuristic methods.		
3	To explore various Statistical modeling and performance analysis of VLSI Circuits.		
4	To study a balance between theory, numerical computation, problem setup for solution by optimization software, and applications to engineering systems.		
5	To study General optimization algorithm; necessary and sufficient conditions for optimality & gains knowledge on Genetic Algorithms and Routing Procedures.		
Course	**Year / semester**	**Subject Name (Subject Code) SYSTEM ON CHIP ARCHITECTURE**	**L: 4 P: 0 C: 4**

Outcome	**I/II Sem**	**(A957208)**	
After the completion of this course, the students should be able to			
1	Learn System on chip fundamentals, their applications & gains knowledge on SOC design.		
2	Learn the various computation models of SOCs & the basic concepts of NoC design by studying the topologies, router design and MPSoC styles.		
3	Learn sample routing algorithms on a NoC with deadlock and livelock avoidance.		
4	Understand the role of system-level design and performance metrics in choosing a NoC design.		
5	Understand the relationship between semiconductor technology, computer architecture and computer networking in the design of the communication network for a MPSoC or a many-core design.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** SEMI CONDUCTOR MEMORY DESIGN AND TESTING (A957209)	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Know the design of MOS memories and the various precautionary methods to be used in their design.		
2	Learn overview of memory chip design, DRAM circuits, voltage generators, performance analysis and design issues of ultra-low voltage memory circuits.		
3	Acquire knowledge about High-Performance Subsystem Memories & Analyse RAM and DRAM Design.		
4	Advanced Memory Technologies and High-density Memory Packing Technologies.		
5	Gain knowledge on various testing methods of semiconductor memories.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) SCRIPTING LANGUAGES (A957210)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Integrate a scripting language and database for various applications.		
2	Design web-based applications using various scripting languages.		
3	Judge the overall ease of use of a web-based application.		
4	Assemble personal web-server that will serve web, database and tunneling services		
5	Design application scripts to traverse a Linux based server and data within communicate and collaborate effectively in laboratory groups.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code) CODING THEORY AND TECHNIQUES (A957211)**	**L: 4 P: 0 C: 4**
After the completion of this course, the students should be able to			
1	Evaluate the information rate of various information sources.		

2	Design lossless data compression codes for discrete memoryless sources.		
3	Evaluate the information capacity of discrete memoryless channels and determine possible code rates to achievable on such channels.		
4	Demonstrate an ability to compensate for channel memory through the design of appropriate data translation codes & linear channel codes for error detection and correction.		
5	Demonstrate the ability to select and design simple linear block error correcting codes ,cyclic block codes using feedback shift register logic circuits and design simple convolutional codes.		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code) ADHOC WIRELESS NETWORKS (A957212)**	**L: 0 P: 4 C: 4**
After the completion of this course, the students should be able to			
1	Understand the state-of-the-art in network protocols, architectures and applications.		
2	Analyze existing network protocols and networks.		
3	Develop new protocols in networking.		
4	Understand how networking research is done.		
5	Investigate novel ideas in the area of Networking via term-long research projects.		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code) VLSI LAB (A957213)**	**L: 0 P: 4 C: 4**
After the completion of this course, the students should be able to			
1	Design shall include Gate-level design/Transistor-level design/Hierarchical design/Verilog HDL or VHDL design, Logic synthesis, Simulation and verification.		
2	Learn secondary effects (temperature, power supply and process corners).		
3	Circuitoptimization with respect to area, performance and/or power, Layout.		
4	Extraction of parasitics and backannotation, modifications in circuit parameters and layout consumption, DC/transient analysis,Verification of layouts (DRC, LVS).		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** Seminar (A957214)	**L: 0 T: 0 P: 4 C:2**
After the completion of this course, the students should be able to			
1	Learn various gestures of oral presentation		
2	Improve the personal strength		
3	Acquire new skills of presentation		
4	Overcome stage fears		
5	Gain technical knowledge		
6	Implement various tools and aids in teaching.		

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Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** Comprehensive Viva Voice (A957301)	**L: 0 T: 0 P: 0 C:4**
After the completion of this course, the students should be able to			
1	Confidently discuss the fundamental aspects of any engineering problem/situation related to wireless communication engineering domain and give answers in dealing with them.		
2	Articulate knowledge on various fundamentals.		
3	Recalls to answer questions from all the courses of the semesters comprehensively		
4	Attain Oral Presentation skills by answering questions in precise manner		
5	Attain Oral Presentation skills by answering questions in concise manner		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** Project Review Work –I (A957302)	**L: 0 T: 0 P: 24 C:12**
After the completion of this course, the students should be able to			
1	Demonstrate a sound technical knowledge of their selected project topic.		
2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		
3	Formulate clearly a work plan and procedures.		
4	Present the project outlining the approach and expected results using good oral and written presentation skills.		
5	Undertake problem identification, formulation and solution		
Course Outcome	**Year / semester II/II Sem**	**Subject Name (Subject Code)** Project Review Work –II (A957401)	**L: 0 T: 0 P: 8 C:4**
After the completion of this course, the students should be able to			
1	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
2	Demonstrate the knowledge, skills and attitudes of a professional engineer when working in a team.		
3	Design and develop a functional product prototype while working in a team.		
4	Communicate with engineers and the community at large in written and oral forms.		

5	Consider the business context and commercial positioning of designed devices or systems