**Koneru Lakshmaiah Education Foundation**
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Department of Electronics and Communication Engineering
Program: M.Tech -VLSI
Academic Year 2020-2021

| Course Code | Course Name | CO NO | CO Description |
|---|---|---|---|
| 20EC5128 | MOS Circuit Design | 1 | Understand basic concepts of VLSI design flow, Design styles, IC fabrication and layout design rules for CMOS circuits |
| | | 2 | Understand and Analyze MOS device operation, second order effects, and concepts related to scaling. |
| | | 3 | Analyze inverter circuits with different loads. Understand the effect of parasitic on circuit performance. |
| | | 4 | Understand and design Combinational and Sequential MOS logic Circuits. Analyze different Dynamic logic circuits |
| | | 5 | Design of Various CMOS Circuits using EDA tools |
| 20EC5129 | Analog IC Design & Design for Testabilit y | 1 | Understand the basic working of MOS transistor and application of MOSFET for the realization of current mirrors and voltage reference. |
| | | 2 | Analysis and design of single stage amplifiers using MOSFET's |
| | | 3 | Analysis and realization of MOSFET operational amplifiers and their deviation from ideality. |
| | | 4 | Analyzing negative feedback in analog circuit and the analysis of non- linear analog circuits for practical application. |
| | | 5 | Design and analysis of analog circuits with the application of multiple circuit typologies and configurations using Mentor Graphics |
| 20EC5130 | ASIC & FPGA Design | 1 | Understand the different types of ASIC design methodologies and Understand the basic coding concepts of digital system design, their modeling techniques in Verilog HDL. |
| | | 2 | Design and Analysis of various Combinational & Sequential Logic realizations using Verilog HDL. |
| | | 3 | Understand the concepts of Floor Planning, Placement and Routing Algorithms |
| | | 4 | Understand of different FPGA architectures. |
| | | 5 | Design and Analysis of digital modules through project |
| 20EC5131 | IC Fabricati on Technolo gy | 1 | Ability to understand the Concepts of design methodologies in routing and layout |
| | | 2 | Understand different levels of modelling of digital circuits and scheduling |
| | | 3 | Ability to understand the FPGA Technologies for development |

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| | | | of physical design |
| | | 4 | Analyze the routing and distribution of cells in ICs |
| 20EC51Q2 | VLSI Signal Processin g | 1 | To understand the basic concepts and processes of VLSI and DSP with iteration bound : means the computation time for the system. |
| | | 2 | To study pipelining and parallel processing for different filters |
| | | 3 | To Analyse about different properties of retiming and unfolding techniques |
| | | 4 | To Analyse about convolution and Filters and Transforms. |
| 20EC51R3 | Semicon ductor Device Modeling | 1 | Understand the basic device physics and study of MOS capacitor |
| | | 2 | Understand and study of MOSFET physics and characteristics. |
| | | 3 | Understanding the energy band diagrams of BJT and time dependent analysis. |
| | | 4 | Understanding the concepts of designing of emitter, base and collector and study of modern BJT. |
| 20 IE5149 | Seminar | 1 | Enhancing verbal delivery, body language, power point skills, structuring the presentation, engaging audience, tone of presentation for the overall improvement of individual presentation skills. |
| 20 TS5101 | Technical Skilling-I | 1 | Understand and recognize various VLSI design modules |
| | | 2 | Interpret and demonstrate combinational circuits design using verilog |
| | | 3 | Interpret and demonstrate Sequential circuits design using verilog |
| | | 4 | Understanding the process of ASICs design fundamentals using verilog |
| 20EC5232 | RF IC Design & Introducti on to mm RADAR | 1 | Understand the basics of RF system design and transmission media and reflection in passive components |
| | | 2 | Study and understanding the distributed systems and noise effects |
| | | 3 | Analysis and realization of voltage controlled oscillators |
| | | 4 | Introduction to mm-wave RADAR and effect the of IC technology in the design of RADARs. |
| | | 5 | Analysis and study of standard functional blocks of communication system at super-high frequencies. |
| 20EC5233 | Low Power VLSI Circuits | 1 | Understand the physics of power dissipation including short circuit power, dynamic power and leakage power, techniques that makes a low power circuit and introduction to simulation power analysis |
| | | 2 | Analyses probabilistic power analysis and apply low power techniques at circuit level for CMOS circuits |
| | | 3 | Apply low power techniques at gate level, architecture level and system levels |
| | | 4 | Understand essential tasks in algorithm and architecture level low power design environments and Apply low power clock tree distribution techniques to create low power devices |
| | | 5 | Design of Various Low Power Circuits |

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| 20EC5234 | Algoritham for VLSI Design Automati on | 1 | Ability to understand the importance Programmable devices in VLSI |
| | | 2 | Understand difference between Data path sub system and array subsystem |
| | | 3 | Ability to understand the methodology of interconnects |
| | | 4 | Analyze synchronization of clock and synthesis of different designs |
| 20EC5235 | Testing of VLSI Circuits | 1 | Understanding and application user-defined primitives in Fault dominance, understanding various simulation and Gate level event-driven simulation for digital circuits. |
| | | 2 | Understanding, Test generation for various Combinational logic circuits and ability to design its Testable Combinational circuits. |
| | | 3 | Design for Testability, Generic scan-based design and Classical scan-<br>based design |
| | | 4 | Analyze and ability to Testable various BIST– MBIST, LBIST. Fault Diagnosis of digital circuits and Diagnosis by UUT reduction. |
| 20EC52S3 | MEMS System Design | 1 | UNDERSTAND THE CONCEPTS OF MOS CIRCUIT DESIGN |
| | | 2 | Analyze different types of buffers in mos circuits |
| | | 3 | Analyze the layouts of MOS circuits |
| | | 4 | Analyze total circuit design of MOS circuits |
| 20EC52T1 | Advance d Digital IC Design | 1 | Develop Program of different logic circuits using Verilog Programming and analyze different types of Faults in logic circuits. |
| | | 2 | Analyze different types of ASIC design methodologies and Different CPLD |
| | | 3 | Analyze ASIC design flow of customized ASICs |
| | | 4 | Analyze Physical design flow of ASIC, Extraction the final circuit |
| 20 IE5250 | Term Paper | 1 | Enhancing the skill sets in research by recognize and identifying problems, exploring/defining the problem by gathering information, formulation of the research objectives, addressing the problem through scientific process and methods. |
| 20 TS5102 | Technical Skilling-II | 1 | Enhancing the system design and modeling capabilities through visualization of scientific theories and concepts while building and developing the capabilities of designing a new system by altering and implementing new algorithm and methods through visualization tools. |

Academic Professor I/C

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