SRM UNIVERSITY

Faculty of Engineering and Technology

DEPARTMENT OF ICE

Course Code : **IC0463**

Course Title : **Basics of VLSI and Embedded System**

Year& Semester : IVyear/VIIth semester

Course Duration : Odd Semester (July-Dec2013)

Location : Tech Park

Faculty Details:

Name of the staff	Section	Office	Office Hours	Mail ID
Mr. Nurmesh Bhartiya	ICE -A	Tech Park	8:45 am-4:00 pm	nurmeshintamilnadu@gmail.com

Required References:

- VLSI technology: S M Sze, Mc Graw Hill pub.
- Basic VLSI design: Douglas Pucknell, PHI.
- Principles of CMOS VLSI Design: H E Weste, Pearson Edn.
- Integrated Circuits: K R Botkar, Khanna Pub.
- CMOS circuit design layout and simulation: Barter, IEEE press.
- Introduction to VLSI: Conway, Addison weslay.
- Raj Kumar, “Embedded Systems: Architecture, Programming and Design”, Tata McGraw Hill, Third Reprint, (2003).
- John Catsoulis, O’Reilly, “Designing Embedded Hardware”, First Indian Reprint, (2003).
- David E. Simon, “An Embedded Software Primer”, Pearson Education Asia, Fifth Indian Reprint, (2002).
- J.W. Valvano, "Embedded Microcomputor System: Real Time Interfacing",Brooks/Cole, 2000

Prerequisite: Basics of VLSI and Embedded System

Objective:

1) To study the fabrication technology

2) To provide adequate knowledge in the various integrated circuits..
3) To give a basic knowledge in describing circuit analysis.
4) To analyze the Embedded systems using programming techniques.
5) To study the design of Systems.

Tentative test details and portions:

Cycle Test - I: Unit I&II

Cycle Test –II: Unit III&IV

Model Exam: All five units

Assessment details

Cycletest-1	10
Cycle test -2	10
Model exam	20
Surprise test 1&2	5
Attendance	5
Total	50

Outcomes

Students who have successfully completed this course can be

Course outcome	Program outcome
1) Introduce the fundamental principles and techniques of fabrication for understanding and designing new circuits and for continued learning	1)The students can understand the types of fabrication technologies and the operations of the circuits.
2) Describes the design and layout of various circuits that are to be processed by fabrication techniques.	2) The students will be able to design, layout and implement circuits.
3) Brief Explaination about the various layouts and stick diagram to design integrated circuits as well as programming techniques used for designing algorithm with the Embedded Systems	3) This course introduce students to the hardware aspects of different types of ICs, and software aspects of Embedded systems
4) Study about the theory of modern VLSI, including hands-on experience with important techniques as well as Embedded System	4) Students can understand the theory and application of VLSI as well as Embedded System

Detailed Session Plan

Day	Name of the topics	Reference
1	Review of nMOS	S M Sze, Mc Graw Hill pub
2	CMOS and bipolar technologies	S M Sze, Mc Graw Hill pub
3	MOS circuits electrical properties	S M Sze, Mc Graw Hill pub
4	nMOS design rules	S M Sze, Mc Graw Hill pub
5	CMOS design rules	Douglas Pucknell, PHI
6	Design of logic gates	Douglas Pucknell, PHI
7	Stick Diagrams	Douglas Pucknell, PHI
8	Repeat Stick Diagrams	Douglas Pucknell, PHI
9	Scaling of MOS circuits	Douglas Pucknell, PHI
10	Pass transistor	Douglas Pucknell, PHI
11	Supper Buffers	Douglas Pucknell, PHI
12	Clocking Strategies	Douglas Pucknell, PHI
13	Types of PLDs	Douglas Pucknell, PHI
14	Design using PAL	Douglas Pucknell, PHI
15	Design using PLA	Douglas Pucknell, PHI
16	Repeat Design using PAL	Douglas Pucknell, PHI
17	Repeat Design using PLA	Douglas Pucknell,

		PHI
18	Revision of unit I&II	Douglas Pucknell, PHI
19	Principles of Embedded System,	Raj Kumar, McGraw Hill, Third Reprint
20	Examples of Embedded System	Raj Kumar, McGraw Hill, Third Reprint
21	. Interrupts: Basics, Shared Data problems,	Raj Kumar, McGraw Hill, Third Reprint
22	Interrupt Latency Survey of software architectures: Round Robin -	Raj Kumar, McGraw Hill, Third Reprint
23	Round Robin with interrupts, Function Queue- Scheduling	Raj Kumar, McGraw Hill, Third Reprint
24	architectures and RTOS architectures	Raj Kumar, McGraw Hill, Third Reprint
25	Revision of Unit III	Raj Kumar, McGraw Hill, Third Reprint
26	RTOS: Task and task states,	Raj Kumar, McGraw Hill, Third Reprint
27	Task and Data, Semaphores and Shared data	Raj Kumar, McGraw Hill, Third Reprint
28	. More Operating System services: Message Queues,	Raj Kumar, McGraw Hill, Third Reprint
29	Mail Boxes and Pipes, Timer functions,	Raj Kumar, McGraw Hill, Third Reprint
30	Events, Memory management,	Raj Kumar, McGraw Hill, Third Reprint
31	Interrupt routines in an RTOS environment.	Raj Kumar, McGraw Hill, Third Reprint
32	Practice Problems of Unit IV	Raj Kumar, McGraw Hill, Third Reprint
33	Revision of Unit IV	Raj Kumar, McGraw Hill, Third Reprint
34	Surprise TestI	Raj Kumar, McGraw Hill, Third Reprint
35	Surprise Test II	Raj Kumar, McGraw Hill, Third Reprint

36	Introduction to VHDL	John Catsoulis, O'Reilly
37	NTT architecture	John Catsoulis, O'Reilly
38	Data type-Operator	John Catsoulis, O'Reilly
39	Repeat Data type-Operator	John Catsoulis, O'Reilly
40	Sequential circuit	John Catsoulis, O'Reilly
41	concurrent circuit	John Catsoulis, O'Reilly
42	Libraries	John Catsoulis, O'Reilly
43	functions	John Catsoulis, O'Reilly
44	Programming practice	John Catsoulis, O'Reilly
45	Revision of all five units	John Catsoulis, O'Reilly