Digital Logic Design

1. Course Title	Digital Logic design
2. Credit Structure	Lecture hours per week: 3 Tutorial hours per week: 0 Practical hours per week:3 Total Credits:4.5
3. Course Code	EL114
4. Program/Semester	B.Tech - Semester II
5. Category	Core
6. Prerequisite courses	None
7. Foundation for	Electronic Engineering Courses, Project based study
8. Abstract Content	❑ The aim of this 14-15 week course is to give a broad grounding in the principles and practice of Digital Logic Design and basic digital electronics. ❑ The course, covers topics in basic digital circuits, combinatorial, sequential circuits, finite state machine, counters, shift registers, RAM, ROM, basic building blocks of computers, and HDL. ❑ This course also involves design/lab element that will cover moderate to advanced use of the following tools and languages: - Logisim tool - Verilog simulator - Hardware design kit - Datasheets ❑ Labs, Homework, Quizzes are used to reinforce learning during the semester
Optional	
Suggested Text book(s)	▪ **Text Book:** ▪ *Digital Design,4th Ed,* M. Morris Mano and M. D. Ciletti,, Pearson Education, ©2007. ▪ *Digital Design*, Morris Mano, Prentice Hall, ©2002. ▪ **Reference Books:** ▪ *Digital Fundamentals,* 10th Ed, Floyd T L*,* Prentice Hall, ©2009. ▪ *Digital Design - Principles and Practices*, 4th Ed, J F Wakerly, Prentice Hall, ©2006 ▪ *Digital Systems: Principles and Applications,* Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, Pearson Education, Limited, © 2011 ▪ *Fundamentals of Digital Logic with Verilog Design,* 2nd Ed, S. Brown and Z. Vrsaniec, McGraw Hill, ©2007
Outcomes and Objectives	❑ Having successfully completed the module, the student will be able to design and implement digital circuits both in hardware and software and understand and use the datasheets.

	❑ Knowledge and Understanding Having successfully completed the module, you will be able to demonstrate knowledge and understanding of: 1. Digital Circuits 2. Basic building blocks of Computer 3. Finite state machine 4. Combinatorial Circuits 5. Sequential Circuits 6. Hardware Description Languages ❑ Intellectual Skills: Having successfully completed the module, you will be able to: 1. Digital Circuit Design Skills 2. Use of basic design Tools 3. Understanding of Digital Simulation 4. Understanding Datasheets ❑ Practical Skills: Having successfully completed the module, you will be able to: 1. Digital Circuit Analysis 2. Logisim simulation and analysis 3. Hardware design, Datasheet interpretation
Comments	❑ 15% Insem1 ❑ 20% Insem 2 ❑ 40% Final Exam ❑ 20% Lab ❑ 5% Quiz

Detailed Course Contents

Lecture	Lecture Notes
Lecture 1-10	Number Systems , Boolean Algebra, K-Maps, Quine McCluskey Minimization techniques
Lecture 11-13	Circuit Analysis, Combinatorial Procedure
Lecture 14-18	Adders, Comparators, Mux, Encoders, Decoders,
Lecture 19-25	Latches, Flip Flops, FSM, State Reduction
Lecture 26-28	Registers, Counters
Lecture 29-34	Timing, Hazards, RAM, ROM
Lecture 35-36	ALU, Datapath Analysis
Lecture 37-38	HDL, Register Transfer Level, PLDs
Lecture 39	Applications of ICT
Lecture 40	Final Exam Review