

Department	Electrical and Computer Engineering
Course Number	EE 261
Course Title	Introduction To Logic Circuits
Course Designation	Required
University Catalog Description	Semesters offered: F,S; Co-Requisites: Math 171 -- An introductory course in the fundamental concepts of classical digital design. Course covers design and implementation of combinational logic circuits, synchronous sequential circuits and information storage circuits. Basic concepts of programmable logic devices and computer-aided design tools are presented.
Faculty Coordinator	Dr. Brock J. LaMeres
Prerequisite by Topic	Algebra
Textbook	Digital Design, Principles & Practices, Fourth Edition Updated, Prentice Hall 2001, John F. Wakerly
Course Objectives	To produce graduates who understand the binary number system, binary codes, the operation combinational and sequential logic circuits, the architecture of programmable logic devices, and the use of Hardware Description Languages.
Course Learning Outcomes	At the conclusion of EE 261, students are expected to : 1) Accomplish number system conversions between decimal, binary, octal and hexadecimal, etc. 2) Understand switching or Boolean algebra and Karnaugh Maps 3) Analyze and design small scale combinational logic circuits 4) Minimize and optimize combinational circuit designs 5) Analyze and design simple sequential circuits 6) Understand the use of combinational and sequential designs in more complex systems 7) Use a hardware description language to describe and simulate a combinational logic circuit.
Topics Covered	1) Binary, octal and hexadecimal numbers and conversions 2) Two's-complement addition and subtraction 3) BCD and Gray codes and other codes 4) Logic gates and logic families, CMOS logic structure, dynamic and steady-state behavior, input and output structures 5) Boolean algebra 6) Combinational circuit analysis, minimization/optimization, and synthesis 7) Karnaugh maps, timing hazards, drawing standards 8) PLD's, decoders and encoders, multiplexers, comparators, adders, ALU's, multipliers 9) S-R latches, D-latches, and D-flip-flops 10) State machine analysis, design and synthesis, state diagrams and state tables 11) Hardware description languages (VHDL)
Class/Laboratory Schedule	EE 261 meets three times /week for 50 minutes
Professional Component (Criterion 5)	Fundamental digital logic concepts are developed to allow the student to analyze and design basic combinational and sequential circuits.
ECE Program Outcomes	EE 261 supports following Program Outcomes: o. An ability to design digital systems using modern design tools.
Total Credit Hours	3
Prepared by	Brock J. LaMeres 5/19/2009