SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: CSCI 321 Department: Eng. And Science Transfer

Course Title: Comp. Org. & Digital Logic Semester: Fall Year: 2001

Objectives/Competencies

Course Objective	Competencies
1. Learn some basic number systems and codes.	1. Convert decimal, binary, octal and hexadecimal numbers into each other. 2. Perform addition and subtraction of nondecimal numbers. 3. Represent of negative numbers in two's-complement and ones'-complement form. 4. Perform binary multiplication and binary division. 5. Identify and apply the gray code and ASCII code. 6. Learn standard codes for actions, conditions, and states, codes for detecting and correcting errors and codes for serial Data transmission and storage.
2. Learn the axioms and theorems of Boolean algebra.	1. Express and manipulate logical statements in terms of logical multiplication and addition. 2. Manipulate logical statements using theorems of identity, null operations, idempotency, involution, complementation, commutativity, associativity, distributivity, covering, combining, and consensus. 3. Manipulate logical statements using generalized

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	idempotency and DeMorgan's theorems. 4. Apply the principle of duality to obtain alternative equivalent logical statements.
3. Learn standard network representation of logic functions.	1. Represent logic operations with AND gates, OR gates, inverters, NAND gates and NOR gates. 2. Express logic statements in terms of truth tables. 3. Draw gated logic networks to represent logic statements. 4. Write logic statements corresponding to gated logic networks. 5. Simplify gated logic networks by use of Karnaugh maps. 6. Recognize timing hazards in logic network design.
4. Learn combinational logic design practices using combinational programmable devices.	1. Implement logic functions using PLAs. 2. Implement logic function using PALs. 3. Implement logic functions using decoders. 4. Implement logic functions using encoders. 5. Implement logic functions using multiplexers. 6. Implement logic functions using comparators. 7. Implement logic functions using adders and subtracters. 8. Implement logic functions using ALUs and combinational multipliers.
5. Learn the principles of sequential logic design.	1. Explain the function of a latches and a flip-flops: S-R, D, T, J-K. 2. Explain the function of counters, and shift registers. 3. Express logical sequences in terms of state diagrams.

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	4. Analyze synchronous sequential networks by deriving their state diagrams. 5. Design synchronous sequential networks by implementing state diagrams. 6. Compare and contrast Moore machines and Mealy machines.
6. Learn the principles of computer design.	1. Analyze and design interfacing between a central processing unit, input devices, output devices and memory devices. 2. Analyze and design a simple stored program information processor.