**CSCE 2114, Digital Logic (4 credit hours), Required**

**Catalog Description**: Introduction to the hardware aspects of digital computers, logic gates, flip-flops, reduction, finite state machines, combinational and sequential logic design, digital systems, software design tools, hardware description language (VHDL), and implementation technologies. Corequisite: Lab component.

**Prerequisites**: MATH 2554

**Textbook/required material**: “Fundamentals of Digital Logic with VHDL Design,” by Stephen Brown and Zvonko Vranesic, Third Edition, McGraw Hill, ISBN: 978-0-07-352953-0, MHID 0-07352953-2

**Goals**: The goal of the class is to develop the ability to apply knowledge of digital logic to the design of a microprocessor and operate an advanced CAD software application.

**Topics covered**:

* Design Concepts
* Intro. to Logic Circuits
* Implementation Technology
* Optimized Implementation of Logic Functions
* Number Representation
* Arithmetic Circuits
* Combinational Circuits
* Flip-Flops, Registers, and Counters
* Synchronous Sequential Circuits
* Asynchronous Sequential Circuits
* Digital Systems
* Computer Aided Design Tools
* Breadboard Techniques
* Basic Logic Circuits
* Combinational Logic
* Sequential Circuits
* CAD Tools
* FPGA Implementations

**Class/laboratory schedule**: Meets either 3 times a week for 50 minutes or 2 times a week for 1 hour 20 minutes for 15 weeks. Lab meets once a week for 2 class periods. Laboratories meet 8 times for 2 hours per lab.

**Relationship of course to Computer Engineering Program Student Outcomes:**

* (a) An ability to apply knowledge of mathematics, science, and engineering.
* (b) An ability to design and conduct experiments, as well as to analyze and interpret data.
* (e) An ability to identify, formulate, and solve engineering problems.
* (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Relationship of course to Computer Science Program Student Outcomes:**

* (a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.
* (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
* (c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
* (i) An ability to use current techniques, skills, and tools necessary for computing practices.

**Academic Honesty Statement:**

As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University’s ‘Academic Integrity Policy' at honesty.uark.edu. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

The following policies will apply to this class:

**Exams:**

* Students are expected to submit their own work on all exams.
* Students are NOT allowed to copy anything from another student, or get any outside assistance during the exam.
* Students ARE allowed to bring a 3”x5” note card with any notes they want into the exam. Otherwise, exams are closed book and closed notes.

**Homework and Programming Projects:**

* Students are expected to submit their own work on all homework and programming projects, unless group projects have been explicitly assigned.
* Students are NOT allowed to distribute code to each other, or copy code from another individual or website.
* Students ARE allowed to use any materials on the class website or in the textbook, or ask the instructor and/or TAs for assistance.

Violations of the policies above will be reported to the Provost's office and may result in a ZERO on the exam or programming project, an F in the class, or suspension from the university, depending on the severity of the violation.

**ADA Statement:**

If any member of the class has a documented disability and needs special accommodations, the instructor will work with the student to provide reasonable accommodation to ensure the student a fair opportunity to perform in this class. Please advise the instructor of the disability and the desired accommodations within the first week of the semester.

**Inclement Weather:**

If the university is officially closed, class will not be held. When the university is open, you are expected to make a reasonable effort to attend class, but not if you do not feel that you can get to campus safely. Assignment due dates will be postponed in case of inclement weather.

**Emergency Procedures:**

Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at emergency.uark.edu.

**Severe Weather:**

* Follow the directions of the instructor or emergency personnel.
* Seek shelter in the basement or interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.
* If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.
* Stay in the center of the room, away from exterior walls, windows, and doors.

**Violence / Active Shooter:**

* CALL - 9-1-1
* AVOID - If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
* DENY - Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
* DEFEND - Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

**Students with Disabilities:**

University of Arkansas [*Academic Policy Series 1520.10*](http://provost.uark.edu/152010.pdf) requires that students with disabilities are provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact me privately at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through the Center for Educational Access (contact *479–575–3104* or visit http://cea.uark.edu for more information on registration procedures).

**Prepared by**: Pat Parkerson **Date**: August 24, 2013