DATE OF LAST REVIEW: 02/2013
CIP CODE: 46.0302
SEMESTER: Departmental Syllabus
COURSE TITLE: Digital Circuits
COURSE NUMBER: ELET0260
CREDIT HOURS: 2
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE (S): None

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC TEC bookstore, http://www.kckccbookstore.com, for the required texts for your particular class.

COURSE DESCRIPTION: This is a beginning course in which students will study and practice the basic concepts of digital electronics. Topics will include digital number systems, logic gates, logic circuits, flip-flops, digital arithmetic, counters and registers.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These may include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.
COURSE OUTLINE:
I. Number Systems
   A. Count in binary and hexadecimal.
   B. Represent numbers in the binary, hexadecimal, BCD, and twos
II. Complement number systems.
   A. Convert between binary, decimal, and hexadecimal.
   B. Convert between two complement and decimal.
   C. Perform arithmetic in the binary, hexadecimal, BCD, and twos
   D. Use ASCII code to represent symbols.
III. Logic Gates and Interfacing
    A. Describe the basic logic operations, OR, AND, and NOT.
    B. Use truth tables to represent the basic logic operations.
    C. Recognize the symbols representing the basic logic gates.
    D. Analyze circuits containing logic gates.
    E. Build logic gate circuits on the DiGiac Trainer and simulator
    F. Troubleshoot and find faults inserted into circuits using the basic
    G. Describe the exclusive-OR and exclusive-NOR operations.
IV. Flip-Flops
    A. Analyze the operation of RS flip-flops.
    B. Analyze the operation of JK flip-flops.
    C. Analyze the operation of D flip-flops and D latches.
    D. Analyze the operation of one-shot flip-flops.
    E. Analyze flip-flop circuits.
V. Arithmetic Circuits
    A. Analyze adder circuits.
    B. Build adder circuits on the DiGiac Trainer and simulator software.
VI. Counters and Registers
    A. Describe the basic function of a register.
    B. Analyze the operation of asynchronous counter circuits.
    C. Analyze the operation of synchronous counter circuits.
    D. Analyze the operation of synchronous/asynchronous counter circuits.

EXPECTED LEARNER OUTCOMES:
A. The student will be able to convert between the binary, decimal, twos complement hexadecimal, and BCD number system.
B. The student will be able to perform arithmetic in the binary, hexadecimal, 2's complement and BCD number system.
C. The student will be able to determine the outputs of gate logic circuits.
D. The student will be able to make truth tables for Boolean expressions.
E. The student will be able to determine the Boolean expression for the output of a logic circuit.
F. The student will be able to determine the outputs of flip-flop circuits.
G. The student will be able to analyze the operation of counters and registers.
H. The student will be able to troubleshoot and find faults in gate circuits.

CORE COMPETENCIES:

The student will be able to convert between the binary, decimal, twos complement hexadecimal, and BCD number system.

1. The student will be able to explain the binary coded decimal system.

The student will be able to perform arithmetic in the binary, hexadecimal, 2's complement and BCD number system.

2. The student will be able to explain math operations.

The student will be able to determine the outputs of gate logic circuits.

3. The student will be able to measure AND gates.
4. The student will be able to measure NOR gates.
5. The student will be able to measure OR gates.
6. The student will be able to measure NAND gates.

The student will be able to make truth tables for Boolean expressions.

7. The student will be able to determine truth table values.
8. The student will be able to explain Boolean algebra

The student will be able to determine the Boolean expression for the output of a logic circuit.

9. The student will be able to explain inputs and outputs.
10. The student will be able to evaluate output results.

The student will be able to determine the outputs of flip-flop circuits.

11. The student will be able to explain use of flip-flop circuits.

The student will be able to analyze the operation of counters and registers.

12. The student will be able to explain system counters and registers operation.

The student will be able to troubleshoot and find faults in gate circuits.

13. The student will be able to check output voltage.
14. The student will be able to check input voltage.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.
SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome anytime.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center at (913) 288-7670 V/TDD.