

12/13/17 DATE
 X REQUIRED COURSE
 ELECTIVE COURSE

Technology DIVISION
 X NEW COURSE
 REVISION

LAKE LAND COLLEGE Course Information Form

| | | | |
|--|-------------------|--|------------------------------|
| COURSE NUMBER: EET 076 | | TITLE: Digital Logic | |
| SEM CR HRS: 3 | Lecture: 2 | Lab: 2 | SOE: ECH: 4 |
| COURSE PCS # | | | (Assigned by Administration) |
| Prerequisites | | | |
| Catalog Description: (40 Word Limit) | | The study of basic digital systems, principles, and techniques. Binary, Hexidecimal, BCD, logic theory, AND, OR, NOT, NAND, and NOR gates, as well as combination gate, Flip Flops and hardware are covered. | |
| List the Major Course Segments (Units) | | Contact Lt Hrs. | Contact Lab Hrs. |
| Digital Introduction | | 2 | |
| Digital Circuit Simulations | | | 3 |
| Number Systems and Codes | | 6 | 6 |
| Logic gates and Boolean Algebra | | 7 | 6 |
| Combinational logic circuits | | 6 | 6 |
| Flip flops | | 9 | 9 |
| | | | |
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EVALUATION

| | | | | | | | |
|------------------|---|------------------|---|--------------------|--|----------------|--|
| QUIZZES: | X | EXAMS: | X | ORAL PRES: | | PAPERS: | |
| LAB WORK: | X | PROJECTS: | | COMP FINAL: | | OTHER: | |

TEXTBOOK

| | |
|------------------------|---------------------|
| TITLE: | Digital Electronics |
| AUTHOR: | Tokheim |
| PUBLISHER: | McGraw Hill |
| VOLUME/EDITION: | 7 th |
| COPYRIGHT DATE: | 2008 |

| MAJOR COURSE SEGMENT | HOURS | LEARNING OUTCOMES |
|---|-------|---|
| | | <i>The student will be able to:</i> |
| Digital Introduction | 2 | Distinguish between analog and digital, site the advantages and drawback of digital techniques compared to analog. Describe the major parts of a digital computer and understand their function. State the differences between parallel and serial transmission. Distinguish between microcomputers, microprocessors, and microcontrollers. |
| Lab Circuit Simulation | 3 Lab | Investigate the operation of various digital circuits using simulation software. |
| Number systems and codes | 6 | Convert numbers to and from Decimal, Hexadecimal, Binary, BCD, and ASCII. |
| Lab 1 & 2 Seven segment display and drivers | 6 Lab | Test the operation of a 7 segment digital display. Find the technical data for the digital display. Student will test the display. Interface the 7446 to the digital display, enter BCD and get the correct digit on the display. |
| Logic gates and Boolean Algebra | 7 | Create truth tables and logic equations for AND, OR, NOT, NOR and NAND gates. Draw the symbols and create truth tables for the basic logic gates. Use basic Boolean theorems, and DeMorgan's theorem to calculate the outcome of a digital circuit. |
| Lab 3 AND, OR, NOT | 3 Lab | Investigate the behavior of single Inverters, AND, and OR gates. Students will calculate and test the outcome of these circuits. |
| Lab 4 Basic Combinatorial Circuits | 3 Lab | Construct simple logic circuits from logic diagrams containing AND or OR gates. Demonstrate the use of a logic probe. Implement logic from a Boolean expression. |
| Combinational logic circuits | 6 | Create circuits using the Sum of the products. Simplify digital circuits. Design digital circuits. Explain the operation of exclusive NAND and exclusive NOR. |
| Lab 5 Logic Gates NOR and NAND | 3 Lab | Investigate the behavior of NAND, and NOR gates. Students will calculate and test the outcome of these circuits. |
| Lab 6 Boolean simplification | 3 Lab | Create a truth table and algebraic equation based on a logic diagram. Simplify the circuit using Boolean algebra. Build the simplified circuit and test. |
| Flip flops | 9 | Combine NAND and NOR gates to create flip flops. Understand the differences between SC, JK, and D flip flops. Recognize pulse steering edge detector circuits. Understand what Asynchronous FF inputs are and how to use them. |
| Lab 7 SC & JK flip flop | 9 Lab | Investigate the NAND gate SC Flip flop. Investigate the JK & D flip flop. |

Course Outcomes: At the successful completion of this course, students will be able to:

- Transformer power on the input equals the power on the output.
- Convert a number from one number system to its equivalent in another number system.
- Write Boolean expression for logic gates and combination of logic gates.
- Use DeMorgan's theorems to simplify logic expressions.
- Describe the difference between synchronous and asynchronous systems.
- Understand the operation of edge triggered flip flops.