

METROPOLITAN STATE COLLEGE of DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

Prefix & Course Number: EET 2310 Crosslisted With*: _____

Course Title: Digital Circuits I

Check All That Apply: Required for Major: Required for Minor: Specified Elective: _____
Required for Concentration: _____ Elective: _____ Service Course:
Required for Certificate:

Credit Hours: 3 (2+2)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 30 Lab 30 Internship _____ Practicum _____ Other (please specify type and hours): _____

Schedule Type(s): B Grading Mode(s): L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): _____

Prerequisite(s): An intermediate algebra course or one and one-half years of secondary school algebra or equivalent and appropriate score on the mathematics preassessment placement test or higher level math course, with a grade of "C" or better

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:


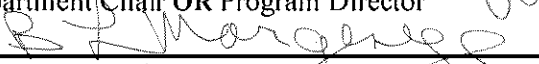

Prerequisite(s): ACT Math 25 or SAT Mathematics 570 or Accuplacer Elementary Algebra 100 or Accuplacer Elem Alg. transfer 100, or MTH 1110, or MTH 1120, or MTH 1400 or MTH 1410, or MTH 2410, with a grade of "C" or better.

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This course covers the analysis and design of logic circuits using Boolean algebra and Karnaugh maps. Adders, comparators, decoders, encoders, multiplexers and other logic circuits are also studied. Flip-flops, memories, analog to digital (ADC) and digital to analog converters (DAC) are used to design simple digital circuits. Computer architecture is introduced.

APPROVED:		<u>3/11/2011</u>
Department Chair OR Program Director		Date
		<u>5-11-11</u>
Dean OR Associate Dean		Date
		<u>6/2/11</u>
Associate VP, Academic Affairs		Date

Required Reading and Other Materials will be equivalent to:

M. Morris Mano, Michael D. Ciletti (2006). *Digital Design* (4th Edition), or latest edition. Upper Saddle Hill, NJ: Pearson Ed

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Convert and perform mathematical manipulation on decimal, binary, octal, BCD and hexadecimal numbering systems and utilize Boolean Algebra, Karnaugh Maps and truth tables to analyze circuits
2. Work with a team to construct, design and trouble shoot simple logic circuits using digital IC chips and write laboratory findings in a concise document comparing theoretical and actual data with models
3. Associate digital IC components with computer architecture components

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):

- | | |
|--|---|
| <p>I. Introduction to Digital Logic</p> <ul style="list-style-type: none"> A. Digital and Analog Quantities B. Basic Logic Operations and Functions C. Testing and Troubleshooting Instruments <p>II. Number Systems:</p> <ul style="list-style-type: none"> A. Binary B. Hexadecimal C. 2's complement numbers D. Boolean algebra E. Arithmetic F. Binary Coded Decimal (BCD) <p>III. Logic Gates:</p> <ul style="list-style-type: none"> A. AND/OR B. NAND/NOR C. XOR D. Logic Families <p>IV. Analysis and Design with Gates</p> <ul style="list-style-type: none"> A. Boolean Minimization <ol style="list-style-type: none"> 1. Karnaugh Map (up to 4 inputs) 2. Other Methods B. Comparators C. Decoders & Encoders D. Parity Generators | <p>E. Multiplexers</p> <p>V. Flip-flops:</p> <ul style="list-style-type: none"> A. Types B. Triggering C. Timing and Propagation Delays <p>VI. Memory:</p> <ul style="list-style-type: none"> A. RAM B. ROM/EPROM C. Magnetic Storage D. Optical Storage <p>VII. Interfacing</p> <ul style="list-style-type: none"> A. Digital to Analog Converters B. Analog to Digital Converters C. GPIB Instrumentation Bus <p>VIII. Microprocessor and Computers</p> <ul style="list-style-type: none"> A. Microprocessor Families B. CPU C. Input Output Ports D. Interrupts E. Direct Memory Access (DMA) |
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Evaluation of Student Performance:

1. Written exams
2. Written lab reports
3. Homework