COURSE SYLLABUS

Tunxis Community College

Education That Works For a Lifetime

Course Title:	Digital Electronics	**Date submitted:**	Spring 2014 (AAC: 14-27
Department:	Business and Technology		
Curriculum:	Engineering Science & Technology		

Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.

Course Code: (eg. ACC 101)	EET*252
Course Type:	X

A: Clinical B: Lab D: Distance Learning
I: Individual/Independent L: Lecture N: Internship
M: Seminar P: Practicum U: Studio
X: Combined Lecture/Lab Y: Combined Lecture/Clinical/Lab Z: Combined Lecture/Studio

Elective Type:	G

AH: Art History E: English FA: Fine Arts FL: Foreign Language G: General HI: History HU: Humanities
LAS: Liberal Arts & Sciences M: Math S: Science
SS: Social Science

Credit Hours:	4
Developmental: (yes/no)	N
Contact Hours: Lecture:	3
Clinical:	0
Lab:	3
Studio	0
Other:	0
TOTAL:	
Class Maximum:	20
Semesters Offered:	F/Sp

Prerequisites:

C- or better in Programming for Engineers (EGR*115), and C- or better in College Algebra (MAT*172) or Precalculus (MAT*186)

Corequisites:

None

Other Requirements:

None

Ability Based Education (ABE) Statement:

At Tunxis Community College students are assessed on the knowledge and skills they have learned. The faculty identified the General Education Abilities critical to students' success in their professional and personal lives. In every class, students are assessed on course abilities, sometimes program abilities, and, in most classes, at least one General Education Ability. Students will receive an evaluation of the degree to which they have demonstrated or not demonstrated that General Education Ability.

Catalog Course Description:

Combinational and sequential logic circuits are covered. Topics include: number systems, Boolean algebra, logic families, MSI and LSI circuits, AC /DC converters, and other related topics. Upon completion of the course, students will be able to construct, verify, and troubleshoot digital circuits using appropriate techniques and test equipment. The course includes a laboratory component.

Topical Outline: List course content in outline format.

1. Number Systems, Operations and Codes (1's and 2's complement, hexadecimal, octal, BCD, digital codes)
2. Logic Gates (CMOS and TTL Technologies)
3. Boolean Algebra (Combinational Circuit Simplification and Karnaugh Mapping)
4. Combinational Logic Analysis (universal property of NAND and NOR Gates, timing

hazards)
5. Functions of Combinational Logic (adders, comparators, decoders, multiplexers/demultiplexers)
6. Latches, Flip-Flops
7. Counters
8. Shift Registers
9. Memory
10. Programmable Logic
11. State Machine Design
12. Clocks

Outcomes:
Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.

Upon successful completion of this course, the student will be able to do the following:

1. perform conversions between number systems
2. perform addition and subtraction in BCD, base 2, base 8, and base 16 number systems
3. create Boolean expression from Karnaugh map
4. build truth tables from logic circuits
5. apply Karnaugh maps to simplify logic expressions
6. apply Boolean algebra to simply expressions
7. troubleshoot digital circuits
8. read and interpret device data sheets
9. describe different types of programmable logic
10. build digital circuit on proto-board
11. design basic digital circuits that use discrete gates, flip flops, and programmable logic
12. design and build counter circuits
13. perform circuit analysis with circuit simulation tools
14. create state machines and implement in PLD's

PROGRAM: *(Numbering reflects Program Outcomes as they appear in the college catalog)*

Engineering Science Associate Degree:

1. demonstrate an understanding of the foundational mathematical and scientific concepts appropriate to the fields of mechanical, civil, or industrial engineering

Technology Studies Associate Degree:

1. identify and apply the design principles of engineering and technology when solving basic engineering problems

GENERAL EDUCATION: *(Numbering reflects General Education Outcomes as they appear in the college catalog)*

7. **Quantitative Reasoning -**Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.

Demonstrates: Interprets numerical information and applies sufficient laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.

Does Not Demonstrate: Misinterprets numerical information or insufficiently applies laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.

Evaluation: List how the above outcomes will be assessed.	**Assessment will be based on the following criteria:** Homework Assignments Exams Quizzes Laboratory Experiments
Instructional Resources: List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.	**Required:** Engineering Lab **Desired:**
Textbook(s)	Check with program coordinator for list of approved texts.