



North Central State College
MASTER SYLLABUS
2019-2020

- A. Academic Division: Business, Industry, and Technology
- B. Discipline: Electronic Engineering Technology
- C. Course Number and Title: ELET1530 Digital Principles
- D. Course Coordinator: Jonathan DeWitt
Assistant Dean: Toni Johnson, PhD

Instructor Information:

- Name: [Click here to enter text.](#)
- Office Location: [Click here to enter text.](#)
- Office Hours: [Click here to enter text.](#)
- Phone Number: [Click here to enter text.](#)
- E-Mail Address [Click here to enter text.](#)

- E. Credit Hours: 4
Lecture: 3 hours
Laboratory: 2 hours
- F. Prerequisites: None
- G. Syllabus Effective Date: Fall, 2019
- H. Textbook(s) Title:

Digital Electronics

- Author(s): William Kleitz
- CopyrightYear: 2012
- Edition: 9th
- ISBN #: 978-0132-5430-33

- I. Workbook(s) and/or Lab Manual: None
- J. Course Description: A study of the binary number system, Boolean algebra, logic and logic circuits, flip flops, registers, counters, and their interconnection in small systems. This curriculum has been previously approved under the Ohio Board of Regents Career Technical Credit Transfer guide (CTAG) and the Transfer Agreement Guide (TAG) as CTEET002 and OET 002 respectively. No changes have been made to the outcomes based on these requirements.

K. College-Wide Learning Outcomes

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Demonstrate the ability to convert to and from binary, hex, octal, and BCD, and convert to and from 8-bit binary-decimal.	Lab – week 1 Quiz – week 2 Homework – week 1 Test – week 5,16
2. Demonstrate the ability to develop a combinational logic circuit composed of NOT, AND, OR, NAND, NOR gates given a boolean equation, truth table, or statement.	Lab – week 2 Quiz – week 3 Homework – week 2 Test – week 5,16
3. Design, verify and/or simplify logic circuits using the rules of Boolean algebra and Demorgan’s Theorem.	Lab – week 3 Quiz – week 4 Homework – week 3 Test – week 5,16
4. Design, verify and/or simplify combinational logic circuits using the rules of Boolean algebra and Demorgan’s Theorem.	Lab – week 4 Quiz – week 5 Homework – week 4 Test – week 5,16
5. Explain the operation of a two’s compliment adder/subtractor circuit and a BCD adder circuit.	Lab – week 6 Quiz – week 7 Homework – week 6 Test – week 10,16
6. Explain the function of an encoder, decoder, multiplexer and demultiplexer.	Lab – week 7 Quiz – week 8 Homework – week 7 Test – week 10,16
7. Discuss and compare the operation of S-R, gated S-R, D and J-K flip-flops and design circuits using flip-flops	Lab – week 7 Quiz – week 8 Homework – week 7 Test – week 10,16
8. Design ripple counters and frequency dividers using J-K FFs.	Lab – week 9 Quiz – week 10 Homework – week 9 Test – week 10,16
9. Design serial or parallel-in to serial or parallel-out shift registers using J-K FFs.	Lab – week 11 Quiz – week 12 Homework – week 11 Test – week 16

Outcomes	Assessments – How it is met & When it is met
10. Explain the operation of memory and storage circuits	Lab – week 12 Quiz – week 13 Homework – week 12 Test – week 16
11. Explain characteristic differences in various Integrated circuit technologies	Lab – week 1 Quiz – week 2 Homework – week 1 Test – week 5,16

M. Topical Timeline (Subject to Change):

1. Binary Number System
 - a. Binary number representation
 - b. Conversions
 - 1) Binary to decimal
 - 2) Decimal to binary
 - 3) BCD
 - 4) HEX
 - 5) OCTAL
 - 6) ASCII
2. Logic Circuits
 - a. Relay Circuits
 - b. Truth tables
 - c. AND- OR - inverter gates
 - d. Boolean equations and logic circuits
 - e. NAND and NOR gates
 - f. DeMorgan's Theorems
 - g. Simplification (basic) - boolean algebra
 - h. Troubleshooting logic circuits
3. Gate Family Characteristics
 - a. TTL and Mos specs
 - b. Electronic signals
 - c. Interfacing
4. Arithmetic Circuits
 - a. Number representation
 - b. Complements - two's
 - c. Binary subtraction - 2's compliment
 - d. Adder/subtractor circuits
 - e. Arithmetic logic unit
5. Code convertors and signal routing
 - a. Encoding
 - b. Decoding
 - c. Multiplexing
 - d. Demultiplexing
6. Flip-Flops
 - a. S-R type (clocked and unclocked)
 - b. Type D
 - c. Type JK
 - d. Edge and level triggering
 - e. Register
7. Counters
 - a. ripple
 - b. Divide-by-N
 - c. 7-segment decoders

- d. Synchronous
- 8. Shift Registers
 - a. Parallel-to-Serial
 - b. Recirculating
 - c. Shift register ICs
 - d. Tri-state buffers
- 9. Memory
 - a. Concepts
 - b. RAM
 - c. ROM

N. Course Assignments:

1. Class activities and discussions
2. Learning checks: Selected Learning Checks are completed during chapter reviews.
3. Homework: Selected problems and questions for each chapter must be completed and turned in as homework.
4. Labs: Selected labs will be completed for each chapter throughout the semester
5. Tests: A test will be given at the end of each chapter during the semester.
6. Final: There will be a comprehensive final at the end of the semester.

O. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70–72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Poor
00–59	F	0.00	Failure

P. Grading and Testing Guidelines:

[Click here to enter text.](#)

Q. Examination Policy:

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R. Class Attendance and Homework Make-Up Policy:

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S. Classroom Expectations:

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T. College Procedures/Policies:

Important information regarding College Procedures and Policies can be found on the [syllabus supplement](#) located at

<https://sharept.ncstatecollege.edu/committees/1/curriculum/SiteAssets/SitePages/Home/SYLLABUS%20SUPPLEMENT.pdf>

The information can also be found Choose an item.