



North Central State College
MASTER SYLLABUS
2014-2015

- A. Academic Division: Business, Industry, and Technology
- B. Discipline: Electronic Engineering Technology
- C. Course Number and Title: ELET1530 Digital Principles
- D. Course Coordinator: Lenny Eaken
Assistant Dean: Lynn Jones

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, 2014
- H. Textbook(s) Title:

Digital Electronics

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

- I. Workbook(s) and/or Lab Manual:

Lab Manual for Digital Electronics: A Practical Approach

- Author: Venable and Wiesner
- Copyright Year: 2007
- Edition: 8th
- ISBN: 978-0132-2398-20

- 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.

K. College-Wide Learning Outcomes

College-Wide Learning Outcome	Assessments - - How it is met & When it is met All listed assignments are graded
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	Class discussions, class activities, tests, and labs – weekly
Information Literacy	Research, circuit simulation – Regularly throughout the semester
Computation	Class discussions, class activities, tests, and labs - Regularly throughout the semester

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. Course Topical Outline:

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:

100-95	A	79-77	C
94-92	A-	76-74	C-
91-89	B+	73-71	D+
88-86	B	70-68	D
85-83	B-	67-65	D-
82-80	C+	64-Below	F

P. Grading and Testing Guidelines:

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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:

Attendance Requirements: All students are required to attend all scheduled classes and examinations. Each faculty member has the right to establish regulations regarding attendance that he/she considers necessary for successful study.

Students who do not attend classes may be administratively withdrawn from those classes. However, failure to attend classes does not constitute withdrawal, and students are expected to process a formal withdrawal through the Student Records Office in Kee Hall.

Academic Misconduct is any activity that tends to compromise the academic integrity of the college, or subvert the educational process. Examples of academic misconduct include, but are not limited to:

1. Violation of course or program rules as contained in the course syllabus or other information provided to the student; violation of program requirements as established by departments and made available to students.
2. Plagiarism including, but not limited to, submitting, without appropriate acknowledgment, any written, visual or oral material that has been copied in whole or in part from the work of others (whether such source is published or not) even if the material is completely paraphrased in one's own words. This includes another individual's academic composition, compilation, or other product, or a commercially prepared paper. Plagiarism also includes submitting work in which portions were substantially produced by someone acting as a tutor or editor.

Such practices constitute plagiarism regardless of motive. Those who deny deceitful intent, claim not to have known that the act constituted plagiarism, or maintain that what they did was inadvertent are nevertheless subject to penalties when plagiarism has been confirmed.

3. Cheating and dishonest practices in connection with examinations, papers and projects, including but not limited to using unauthorized notes, study aids or information on an examination; obtaining help from another student during an examination; taking an exam or doing work for another student; providing one's own work for another student to copy and submit as his/her own; or allowing another student to do one's work and then submitting the work as one's own. Also included would be altering a graded work after it has been returned, then submitting the work for re-grading; or submitting identical or similar papers for credit in more than one course without prior permission from the course instructors.
4. Fabrication including but not limited to falsifying or inventing any information, data or citation; presenting data that were not gathered in accordance with defined appropriate guidelines, and failing to include an accurate account of the method by which data were collected.
5. Obtaining an Unfair Advantage including, but not limited to stealing, reproducing, circulating, or otherwise gaining access to examination materials prior to the time authorized by the instructor; unauthorized collaborating on an academic assignment; taking, hiding or altering resource material; or undertaking any activity with the purpose of creating or obtaining an unfair advantage over another student's academic work.
6. Aiding and Abetting Academic Dishonesty including, but not limited to providing material, information or other assistance to another person with the knowledge that such aid could be used in any of the violations stated above, or providing false information in connection with any inquiry regarding academic integrity.
7. Alteration of Grades or Marks including but not limited to, action by the student in an effort to change the earned credit or grade.

In addition, cases of academic dishonesty may involve photocopied materials. Materials used may fall under the Copyright Act. Violations of said Act may subject the user and/or the College to sanctions. If you have questions whether a particular use is in violation of the Act, please contact the office of the Vice President for Academic Services.

Statement on Disabilities: Any student who requires reasonable accommodations related to a disability should inform the course instructor and the Coordinator of Specialized Services (Room 138 in Kee Hall; phone 419-755-4727).

Students who encounter difficulty in any of their courses are encouraged to visit the Tutoring Resource Center (Room 119 in Fallerius Technical Education Center) for tutoring assistance, and the Student Success

Center (Room 136 in Kee Hall) for academic assistance, advising services, referrals for personal counseling and Learning Disability (LD) Testing.

Statement on Withdrawals: As a student, you are expected to attend class. If you are unable or choose not to attend class, or if for whatever reason you are unable to keep up with the requirements of a course, you need to officially drop the class at the Student Records Office. Refund dates and withdrawal dates will vary slightly from term to term. Contact the Student Records Office for applicable dates. Additionally these dates are posted on the academic calendar available on the college's website, www.ncstatecollege.edu, under the Academics heading on the home page and are available at the Student Records Office in Kee Hall,. Students should go to the Student Records Office (Room 142 in Kee Hall) to process their withdrawal from any class.

If you choose to walk away from your class without officially withdrawing from it, the faculty member teaching the class must grade your classroom performance on the material available to him or her. This normally results in an "F" grade. An "F" grade can lower your grade point average considerably depending on the total credits accumulated.