

## CpE 200: Digital Logic Design II

### CATALOG DATA

Design of sequential circuits, finite state machines (FSMs), and arithmetic circuits. Timing analysis. Use of programmable logic devices (PLDs) and hardware description languages (HDLs). Assembly language.

### COREQUISITES AND PREREQUISITES

Corequisites: CpE 200D and CpE 200L.

Prerequisites: CpE 100 with a grade of C or better.

### TEXTBOOK

“Fundamentals of Logic Design,” 7th Edition by Charles H. Roth, Jr.

Publisher: Cengage Learning

Publication Date: 2014

ISBN-13: 9781133628477

### PREREQUISITE BY TOPIC

Combinational logic design

### COURSE TOPICS

- Models of Sequential Circuits
- Mealy and Moore Machines, State Reduction, State Assignment Techniques
- Sequential Network Design
- Sequential Network Design with PLDs
- State Machine Design with SM Charts
- Introduction to computer arithmetic
- Introduction to HDL

### LEARNING OUTCOMES (Student outcomes) [UULO course outcomes]

Upon completion of this course, students will be able to:

1. reduce a state table to a minimum number of rows (1.2, 1.3, 1.4) [1,2]
2. specify an efficient set of state assignments for a state table (1.2, 1.4) [1,2]
3. drive a state table and assignment, derive flip-flop input equations (1.2, 1.4) [1,2]
4. design a sequential network using gates and flip-flops, iterative networks, counters ROMs, PLAs, PALs and PLD's. Test the final product (1.4, 1.6, 1.7, 1.8) [1,2]
5. use the State Machine Chart as a design tool. Concept of Map Entered Variable and minimization for practical circuits (1.4, 1.6, 1.7, 1.8, 3.4) [1,2]

6. use computer software to simplify sum-of-products, product-of-sums, plot Karnaugh map, and reduce the number of states (1.10, 2.2, 3.4) [1,2]

## STUDENT OUTCOMES

1. The appropriate technical knowledge and skills
  2. An ability to apply advanced mathematics such as differential equations and discrete mathematics,
  3. An ability to apply knowledge of basic sciences,
  4. An ability to apply knowledge of computer science,
  5. An ability to apply knowledge of probability and statistics,
  6. An ability to apply knowledge of engineering,
  7. An ability to design a system, component, or process to meet desired needs within realistic constraints,
  8. An ability to identify, formulate, and solve engineering problems,
  10. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## COMPUTER USAGE

Logic Aid Software

## GRADING

Homework Assignments, Logic Aid Assignments, Test 1, Test 2, Final.

## COURSE SYLLABUS PREPARER AND DATE

Dr. Mei Yang, Monday, 12/15/2014

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**Religious Holidays Policy**—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor **within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses**, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

### **Transparency in Learning and Teaching**

The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:

<https://www.unlv.edu/provost/teachingandlearning> or <https://www.unlv.edu/provost/transparency>

### **Library Resources**

Students may consult with a librarian on research needs. For this class, the subject librarian is Sue Wainscott. ([https://www.library.unlv.edu/contact/librarians\\_by\\_subject](https://www.library.unlv.edu/contact/librarians_by_subject)). UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <https://www.library.unlv.edu>.

**Incomplete Grades**—The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

### **Tutoring and Coaching**

The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

### **UNLV Writing Center**

One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>.

**Rebelmail**—By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

**Final Examinations**—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.