



Department of Computer Science and Engineering
CPE 301: Microprocessor System Design
Laboratory
Spring 2012

Instructors: Dwight Egbert and Khoa Tran

Offices: Dr. Egbert - SEM 322 (11:30AM-1:00PM - M & W, or by appointment)
Mr. Tran - SEM 323A (TBA)

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Course Objective:

Provide students with the opportunity to gain experience in microprocessor-based system design, assembly language programming, and I/O interfacing to microprocessors.

Course Outline:

The course is broken into individual labs which will illustrate the principles covered in the lecture. Each student will design, build, test and troubleshoot (if necessary) interface circuits to a Single Board Computer (SBC) and write programs to execute on the same SBC. Each student will also design and implement hardware circuits for a Xilinx FPGA (Field Programmable Gate Array).

Academic Success Services:

Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and University Writing Center (784-6030 or www.unr.edu/writing_center/). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

If you have a disability for which you will need to request accommodations, please contact me or Mary Zabel at the Disability Resource Center (Thompson Student Services – room 100, 784-6000, or www.unr.edu/drc/), as soon as possible to arrange for appropriate accommodations.

Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

Course Format:

Show up ready to work. You should be comfortable with the material and know how to complete the lab objectives. If schematic diagrams are required, have them ready. If you will be required to design a given circuit, thoroughly understand the fundamentals involved in the design, and be ready to sit down and design it. Have questions ready for the current week's lab, and if you feel uncomfortable about the next following week's material, talk with the lab instructor or the lecture instructor before the next lab. At the beginning of each lab session there will be a brief discussion covering details specific to that lab and to answer any questions you might have. The bulk of the three hour period is for the lab work.

This is a hands-on course and each student must build his or her own circuits and write his or her own programs. Circuit parts will be provided, but you are expected to have your own basic tools to assemble them. The following tools will be needed and must be purchased by each student:

You will need the following items prior to Lab 1.

- JE24 Breadboard
- JE10 Wire Jumper Kit
- wire cutters or heavy scissors
- 3.5 Floppy disks or Thumb Drive or CD-R/W
- Lab Notebook (**MUST BE BOUND**)
- loose leaf binder for handouts.

- Read the **Safety Issues and Guidelines** document and answer all questions on the safety quiz.
- Your **completed safety quiz will be collected at the beginning of the first Lab** session.

Students without these items will not be admitted to lab

Each student must purchase and maintain a **BOUND** lab notebook. The lab instructor will ask to review your lab notebook **each lab session**. The exact type of notebook is unimportant, but the **pages must be permanently bound**. The lab notebook should be used to record your laboratory experiences, observations, setup details, and anything else that occurs. The Lab handouts should be kept in a loose leaf binder to accompany your lab notebook. The notebook should provide a permanent, chronological record of lab work and analysis. The use of such lab notebooks is required by most companies as a way of documenting "intellectual property" and providing legal proof of when something occurred. It's also a very **GOOD** habit to develop.

The above items can be purchased at the UNR Bookstore or ordered from a catalog.

At the end of each lab section all work will be cleared from the computer. The lab computers include floppy drives, CD burners, USB ports, and an internet connection. It is highly recommended that these devices be used to regularly back up your work.

Grading:

Each student must build his or her own circuits and write his or her own programs. The resulting circuits or programs must then be demonstrated to one of the course instructors in order to obtain a grade for each lab. The instructors will also examine each student's lab notebook and ask questions to make sure each student understands the completed work. The completeness of the notebook and answers to questions will affect the grade. Formal lab reports will not be required.

The demonstration of each lab should be completed during the current lab session, however if this is not possible the demonstration must be completed before the next following lab begins. This means that if you cannot complete your lab work during the 3 hour lab period you can still complete it outside of lab time and demonstrate it, **during posted office hours**, before the next lab period. The laboratory room is available to students anytime the building is open. The lab door has a combination lock and the combination will be provided to students.

LAB DEMONSTRATION	70%	LAB GRADE	20%
LAB NOTEBOOK & ANSWERS	30%	LECTURE GRADE	80%

Labs will be graded from 0 - 100 points based on correctness and completeness, notebooks, and answers to questions. Each unexcused lab absence will reduce your Lab grade by 5%.

STUDENTS MUST PASS BOTH LECTURE AND LAB IN ORDER TO PASS THE COURSE

Passing the lecture means that the average score for all exams is passing (≥ 50)

Passing the Lab means that the average for all labs is passing (≥ 50)

Assuming you have a passing grade in both the lecture and lab then your course grade will be calculated as defined in the lecture syllabus.