Syllabus
EE 3610
Digital Systems

Description: Introduction to digital systems, arithmetic logic units, memory systems, microprocessor architecture, input output interfaces, peripheral devices, and communication. Lecture and lab combination. Laboratory activities to include the programming and operation of programmable logic circuits.

Instructor: Dr. Fon Brown, 626-7781 (Office), Building 4, Room 421E
Office Hours (Ogden, Room 421E) TR 11:30-12:30 PM, MW 4:00-5:00PM.
E-mail: fonbrown@weber.edu

Prerequisite: EE 2700 Digital Circuits or EE 3010 Electric Circuits
CS 1410 Object Oriented Programming or Equivalent

Text: Charles H. Roth, Jr. and Lizy Kurian John*, Digital Systems Design Using VHDL,* 2nd Edition, Cengage.

Student Learning Outcomes: The students will demonstrate:

1. The knowledge of microprocessor architecture.
2. The ability to design and utilize arithmetic logic units.
3. The ability to design large scale digital systems utilizing programmable logic
4. The ability to describe digital systems using hardware description languages

Homework: Homework is due two class periods after it is assigned. Homework must be clear and well organized on engineering paper and conform to the guidelines attached to this syllabus. Use only one side of each sheet and submit folded lengthwise, with your name, the class (EE 3610) and the assignment number written on the outside. Do not use multiple columns; separate problems with horizontal bars and box each answer. Homework that does not conform to this format will be penalized one point. Late homework will be accepted and may be graded if time permits, but a 20% penalty will be assessed.

Quizzes: Quizzes will be unannounced and be given in class.

Labs: Laboratory assignments will be made in class and may be done individually or in groups of two. Each student is required keep a lab notebook that conforms to the guidelines given in this syllabus. Labs must be signed off within one week of the date they are due, otherwise a 20% penalty will be assessed. (Lab 7 can be signed off late immediately following the Final Exam).

Exams: There will be one midterm exam and a final exam. All exams are open-text, open-note.

Grading: Grades are based on the weighted average of the exams, labs, homework and quiz scores as shown below. Scores may be normalized to the high in the class (at the instructor's discretion).

Homework & Quizzes	25%
Laboratory Assignments	30%
Midterm Exam	20%
Final Exam	25%

Letter grades are assigned according to the scale below. Borderline cases may be promoted (again, at the instructor's discretion).

A	93% or more
A-	90% - 92.99%
B+	87% - 89.99%
B	83% - 86.99%
B-	80% - 82.99%
C+	77% - 79.99%
C	73% - 76.99%
C-	70% - 72.99%
D	60% - 69.99%
F	below 60%

Topic Outline:

1. Digital circuit design review
2. Introduction to Hardware Description Language
3. Designing with Programmable Logic Devices
4. Design of Networks for Arithmetic Operations
5. Digital Design with SM Charts
6. Designing with Programmable Gate Arrays
7. Floating Point Representation
8. VHDL Models for Memories and Busses
9. Hardware Testing and Design for Testability

Services for Students with Disabilities: Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in Room 181 of the Student Services Center. SSD can also arrange to provide course materials (including the syllabus) in alternative formats if necessary.

Homework Guidelines

	Month / Day / Year	*Course Number*	*Name (Last, First)*	1/2

1.1 a

Complete Problem Definition. Including figures, graphs, schematics, etc. May be copied directly from the assignment.

Leave some space between definition and solution

Show Problem Solution.

SHOW ALL WORK

Box Final Answer and Units

Separate parts with one line

1.1 b

Separate problems with a double line.

1.2

Repeat the above format for all remaining problems.

NOTES:

1. Use only one side of engineering paper [E-2].
2. Number all pages (page # / of #).
3. You can work more then one problem per page if space is
4. available.
   Use PENCIL and eraser.
5. PRINT, no script. All printing must be neat and horizontal.
6. Each problem definition should have all pertinent
7. information required to understand the problem without referring to the textbook.
   Organize your solution so that it can be easily followed.
8.

Lab Book Guidelines

Keeping a proper lab book is important because it can be used in a court of law to establish ownership of intellectual property (which is, after all, the primary output of all engineering). You are required to use a lab book in ECE3610 and to follow the guidelines listed below.

General Guidelines

1. Lab books must be bound such that pages cannot be inserted or deleted without leaving evidence. Three ring binders, spiral bound notebooks or books that use glue bindings are not acceptable.
2. All pages must be numbered. If the lab book does not have pre-printed page numbers, it is acceptable to number each page by hand as it is used.
3. All work must be legible and in ink.
4. Printed work may be included in the lab book if it is glued or taped such that it cannot be removed without leaving evidence.
5. Each page must be signed (or initialed) and dated as it is used. If a page contains work from different dates, it must be separated with horizontal lines, and each section must be signed (or initialed) and dated.
6. Blank pages or large blank spaces are not acceptable. If you wish to leave a blank page or large blank space, draw a diagonal line from one corner to another, then initial and date it.
7. Do not obliterate. Obliteration is defined as (a) overwriting something, (b) scribbling out something or (c) using white-out to cover something. The correct way to handle a small error is to strike it out with a single horizontal line. For large errors, use a single diagonal line. If the strikeout occurs on a different day, then it must also be initialed and dated.
8. Use your lab book as a workbook. Do not transfer notes from scratch paper into your lab book.

Guidelines Specific to EE3610

9. Start each lab at the top of a new page. For each lab, write a title and a short description.
10. Use the first page in your lab book as a table of contents. Each time you start a lab, add an entry with its title, date and page number.
11. Conclude each lab with a signed, dated summary or conclusion that briefly describes how the circuit performed. The summary should also mention what problems were encountered and what, if anything, can be improved.