

ECHT-130 - 3 Units
August 25 - December 10

No Class on November 26 due to Thanksgiving

Division of Industry & Technology 310-660-3600

6:00 PM ~ 7:00 PM Tu, Th Lecture ... Bob Diaz.....IT-209
7:15 PM ~ 9:20 PM Tu, Th Lab Bob Diaz.....IT-209
The exact end of lecture and beginning of lab will vary.
ECHT-130 #7480 rdiaz@elcamino.edu

El Camino College is committed equal employment and educational opportunities for all individuals, regardless of race, color, ancestry, religion, gender, national origin, martial status, sexual orientation, handicap, age, and Vietnam-era status.



Textbook: Required; **The Digital Collection**, By Bob Diaz, I believe this book is around \$12 from the ECC Book Store.
The second book is **Digital Electronics**, by Dueck and Read, Delmar Cengage Learning.
There will also be handouts for this class. I also STRONGLY suggest you **get a 3 ring binder to hold all the materials** and a wire bound notebook for labs.

Course Discription: This is an introductory course in digital logic circuit theory and practice used in contemporary computer, control, instrumentation and security systems. The course begins with the development of simple digital elements, which are combined in increasingly complex functions to perform higher-level logic functions. The laboratory exercises give the student the opportunity to verify the ideas presented in lecture, and explore the capabilities and limitations of commonly used logic circuits.

Course Prerequisite: None, but ECHT-11 is recommended

Course Objectives:

1. Compare and contrast analog and digital parameters and systems.
2. Manipulate and convert between decimal, binary, octal and hexa-decimal number systems.
3. Assess commonly used logic operators, singly or in combination, and describe their behavior with truth tables and logic expressions.
4. Synthesize combinatorial circuits using the "Sum of the Products" concept.
5. Identify by name and describe the operation of all commonly used bistable multivibrators ("flip-flops").

6. Identify by name and describe the operation of all commonly used counter circuits.
7. Design, construct, and test a small digital system, which may include one or more of the following functions: encoders and decoders, multiplexers and demultiplexers, parity generators and decoders, and MOD n counters.
8. Design, simulate and troubleshoot digital circuits and systems using computer-based software.

Student Learning Outcomes:

SLO #1 **DE MORGAN'S THEOREM:** The student will use DeMorgan's Theorem to reduce a Boolean Statement in its simplest terms.

SLO #2 **SEVEN BASIC FUNCTION GATES:** The student will use discrete NOR and NAND Gates to construct all seven basicfunction gates (NOT, OR, NOR, AND, NAND, XOR [EXOR], and XNOR [EXNOR]).

SLO #3 **EXPERIMENTAL DATA AND ANALYSIS REPORTING:** The students will be able to incorporate experimental data and analysis reporting protocols, using either "paper" or "paperless" environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.

Assessment Activites:

Four things determine your grade: The Mid-Term, the Final, the Capstone Project, and Labs/Attendance. The total for each item is converted into a percentage of the total grade as follows:

Mid-Term	25%
Final	25%
Capstone Project	20%
Labs 15 total & Attendance	30%

Total	100%

Your attendance will have a major impact on your grade.

Evaluation Criteria:

All tests will be True/False and Multiple Choice. You will be writing directly on the test.

For both Mid-Term and Final, there is a set day for taking each one. If you are going to be out that DAY, please let me know BEFORE the test. **There are no "Late Tests".**

Grading Scale: Your final grade for this class is calculated as a percentage of possible points.

100% - 90%	=	A
89% - 80%	=	B
79% - 70%	=	C
69% - 60%	=	D
59% - 0%	=	F

Instructor: Bob Diaz, Instructor, El Camino College

rdiaz@elcamino.edu

I do not have an office.

If you need to talk to me, I will stay late for you.

310-660-3593 x4209 voicemail only

Labs & Project:

There are a total of 15 Labs and 1 major project. Weeks 9 through 12 are set aside for the project. Many students finish the project in 2 weeks, most take 3 to 4 weeks.

El Camino College

CLASSROOM POLICIES

EL CAMINO COLLEGE MISSION STATEMENT

The mission of El Camino College is to meet the educational needs of our diverse community and ensure student success by offering quality comprehensive educational opportunities.

ATTENDANCE POLICY

1. Attendance at first class

Students who enroll in class but do not attend the first scheduled class meeting may be dropped from the roster. A student who registers for a class and never attends is still responsible for dropping the class.

2. Attendance without official enrollment

Students will not be permitted to attend classes in which they are not enrolled.

3. Attendance during semester

A student may be dropped from class when the number of hours absent exceeds the number of units assigned to the course. If your absences and tardiness exceed the unit value of the course, you can be dropped. This rule also applies to excessive absences due to illness or medical treatment.

CHILDREN IN CLASSROOMS

Children are not permitted in classrooms while class is in session. Attendance in class is limited to officially enrolled students and authorized visitors or guests. In addition, students must not allow children to be left unsupervised or unattended anywhere on campus.

CLASSROOM MISCONDUCT

1. Dishonesty, including but not limited to cheating, plagiarism or knowingly furnishing false information to the College.
2. Forgery, alteration, or misuse of college documents, records, or identification.
3. Violation of college policies or off-campus regulations, including but not limited to campus regulations concerning student organizations, the use of college facilities, or time, place, and manner of public expression.
4. Continued disruptive behavior, continued willful disobedience, profanity or vulgarity, or continued defiance of the authority of, or abuse of, college personnel or to anyone on campus.
5. Willful misconduct which results in injury or death to a student or college personnel.
6. Assault, battery, sex crimes including sexual assault or rape, or any threat of force or violence upon a student or college personnel.
7. Sexual harassment which includes unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature.

8. Obstruction or disruption of teaching, research, administration, disciplinary proceedings, or other authorized college activities including but not limited to its
9. community service functions or to authorized activities held off campus. Obstruction or disruption includes but is not limited to the use of skateboards, bicycles, radios, and roller skates.
10. Unauthorized entry to or use of college facilities, equipment or supplies.
11. Theft or deliberate damage to property of a college staff member, a student, or a visitor to the college including but not limited to the Library, Bookstore, and Food Service areas.
12. Defacing or damaging any college real or personal property.
13. Failure to comply with the directions of a member of the college certificated personnel, college management or supervisor personnel, or campus police acting within the scope of his or her duties.

DISCIPLINARY ACTION

Disciplinary action appropriate to the misconduct as defined above may be taken by an instructor the Dean of Student Services or his or her designee and the Board of Trustees.

Misconduct should be brought to the immediate attention of the Campus Police, or local police department/security force for courses taught off campus.

Removal by Instructor — In addition to an instructor's right to drop a student permanently from a class when the student is no longer participating i.e. lack of attendance in the course, an instructor may remove (suspend) a student from his or her class for the day of the incident and the next class meeting. During this period of removal, a conference should be held with the instructor and the student to attempt to resolve the situation that led to the student's removal and the student shall not be returned to the class from which he or she was removed without the concurrence of the instructor of the class.

1. If a student is suspended for one class meeting, no additional formal disciplinary procedures are necessary.
2. If a student is suspended from class for the day of the incident and the next class meeting, the instructor shall send a written report of the action to his or her dean who shall forward this information to the Dean of Student Services, the Provost. If the student removed by an instructor is a minor, the President's designee (Dean of Student Services) shall ask a parent or guardian of the student to attend a parent conference regarding the removal as soon as possible. If the instructor or the parent or guardian so requests, a college administrator shall attend the conference.
3. The instructor may recommend to his or her dean that a student be suspended for longer than two class meetings. If the dean, instructor and student cannot resolve the problem, the suspension will be referred to the President or the President's designee.
4. During the period following the initial suspension from class for the day of the incident and the following class meeting, the student shall be allowed to return to the class until due process and the disciplinary procedures are completed unless the student is further suspended as a result of actions.

CHEATING OR PLAGIARISM POLICY

This policy applies to all forms of dishonesty, including but not limited to cheating, plagiarism or knowingly furnishing false information to the college.

CONSEQUENCES FOR CHEATING OR PLAGIARISM

Given alleged violation of the Standards of Conduct, any or all of the following actions may be imposed:

1. When there is evidence of cheating or plagiarism in classroom work, students may receive an F for that piece of work or may be suspended from all classes for that term and the following term if deemed appropriate.
2. The instructor may assign a failing grade to the examination or assignment in which the alleged cheating or plagiarism occurred. This action is based on information that the instructor had.
3. The instructor may dismiss the student from the class or activity for the present and/or following class session(s)
4. The instructor may recommend suspension or expulsion of the student from the college as stipulated in BP5138, Section IIB6 and 8. This recommendation must be in accordance with El Camino College's Due Process and Disciplinary Procedures.
5. The instructor will complete the Academic Dishonesty Report Form and submit it to the Academic Affairs Office.

EXAMPLES OF CHEATING OR PLAGIARISM

1. Representing the words, ideas or work of another as one's own in any academic exercise (plagiarism), including the use of commercial term paper companies;
2. Copying or allowing another student to copy from one's paper or answer sheet during an examination;
3. Allowing another individual to assume one's identity for the purpose of enhancing one's grade in any of the following: testing, field trips or attendance;
4. Falsifying or attempting to falsify attendance records and/or grade rosters;
5. Changing answers on a previously scored test, assignment or experiment with the intent to defraud;
6. Inventing data for the purpose of completing a laboratory experiment or case study analysis with the intent to defraud;
7. Giving and/or taking information during an examination by any means such as sign language, hand signals or secret codes;
8. Obtaining copies of notes, exams or exam questions by any means other than distribution from the instructor. (This includes copying and removing exam questions from the classroom for any purpose.);
9. Using study aids such as calculators, tape recorders or notes that have been specifically prohibited by the instructor.

STUDENTS WITH DISABILITIES

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Special Resource Center as soon as possible to better ensure such accommodations are implemented in a timely fashion. Also, please contact the instructor privately to discuss your specific needs.

ADDITIONAL ITEMS

USB Flash Memory Stick required; 2 GB or larger. The deep freeze software on the computer will erase anything you try and save on the hard drive. The USB Drive is the only way to keep your work. There are also additional documents that we use in class and the flash drive is how we save them.

Scientific Calculator, suggested, but not recommended: The TI-30x IIs (about \$15) has an engineering mode that allows you to enter and see the standard engineering units. This is only used for the first part of the class.

Class Number Assignment: All students will be assigned a one or two digit class number. This number will be used for checking out equipment, on labs, quizzes, and tests. The number makes it easier to keep track of things.

Lab Equipment: Many of the labs will be done through computer simulation, but some of the labs we will build and test the circuits. You are responsible for the equipment. If the equipment is lost or damaged, you will have to pay for it. Failure to pay the damages will result in freezing all of your grades and locking you out of getting into new classes until the debt is paid.

Labs And The Schedule: When we look at the Tentative Schedule, you'll notice that it's broken into blocks. The idea is that you want to finish the Projects and Activities listed within that block before the end of that time period to avoid falling behind. If you are able to finish everything before the end of the time period, that block is finished and you do not need to stay for lab. There is a check off list that I will need to go over with everyone either before the end of the block or on the last day of the block.

Late Labs: I will allow for late labs (labs past the end of the block), but be careful, you can fall behind very quickly.

There is no lab time on the week of the final.

Class Notes: Please put all your class notes into a spiral binder. **You may use your own handwritten notes during any test.** Lose papers will not be allowed, nor will any printed material.

ECHT-14 vs. ECHT-130: There is very little difference between the two classes. Both cover Digital Logic and both cover roughly the same material. ECHT-130 may be substituted for ETEC-14 and ETEC-14 may be substituted for ECHT-130.

Tentative Schedule

Weeks 1: August 25 & August 27

Introduction & Orientation,
02 Digital Logic Introduction,

No Labs for this week

09 Digital Logic Pages 8 - 15

Week 2: September 1 & September 3

02 Digital Logic Introduction,
03 Numbers and Codes

09 Digital Logic Pages 8 - 15

Week 3: September 8 & September 10

03 Numbers and Codes
04 Gates and Boolean Logic

Week 4: September 15 & September 17

04 Gates and Boolean Logic

Week 5: September 22 & September 24

04 Gates and Boolean Logic,

09 Digital Logic Pages 30 - 33

Week 6: September 29 & October 1

04 Gates and Boolean Logic,

09 Digital Logic Pages 30 - 33

Week 7: October 6 & October 8

05 Combinational Logic,

09 Digital Logic Pages 18 - 27

Week 8: October 13 & October 15

05 Combinational Logic,

09 Digital Logic Pages 18 - 27

>>>>> Mid-Term Thursday, October 15 <<<<<

Week 9: October 20 & October 22

06 Computer Math
Start Project; Dice Decoder

Week 10: October 27 & October 29

07 Latches and Flip-Flops,

09 Digital Logic Pages 35 - 44

Week 11: November 3 & November 5

07 Latches and Flip-Flops,

09 Digital Logic Pages 35 - 44

Week 12: November 10 & November 12

08 Counters and More,

09 Digital Logic Pages 46 - 58

Week 13: November 17 & November 19

08 Counters and More,

09 Digital Logic Pages 46 - 58

Week 14: November 26 & November 26 <<< HOLIDAY NO CLASS

08 Counters and More,

10 Arduino Notebook

Week 15: December 1 & December 3

08 Counters and More,

10 Arduino Notebook

Week 16: December 8 & December 10

December 8 = Review,

Review & FINAL EXAM

No Labs on the last week

>>>>> Thursday, December 10 = Final Exam <<<<<