

ECHT-120 - 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 M, W Lecture ... Bob Diaz.....ITEC-209

7:15 PM ~ 9:20 PM M, W Lab Bob Diaz.....ITEC-209

The exact end of lecture and beginning of lab will vary.

ECHT-120 #7470

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 Transistor Collection**, By Bob Diaz, I believe this book is around \$10 from the ECC Book Store. The second book is **Semiconductors From Book To Breadboard**, by Kenin A. McGowan, Delmar Cengage Learning, around \$55. 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 course provides the student with a background in modern solid-state devices for electronic technician work or troubleshooting. Emphasis is placed on testing devices, combined with study of typical applications. The course of study includes student construction of an Amplitude Modulation (AM) radio and experience with computer simulation of laboratory experimentation.

Course Prerequisite: None, but ECHT-11 is recommended

Course Objectives:

1. Identify various transistors, and other related semiconductors by their schematic symbol.
2. Test and identify diodes, Bipolar Junction Transistors (BJTs), and related devices.
3. Design, build, test and troubleshoot diode circuits.
4. Demonstrate transistor operation and describe its characteristics and various parameters such as basic operating polarities and the Effects of Beta (HFE).
5. Build and test the five biasing schemes for transistors.
6. Construct and test an AM radio and troubleshoot the operation of the antenna system, mixer, and local oscillator.
7. Conduct Radio Frequency (RF) alignment on a typical superhetrodyne (AM receiver) using a RF generator, frequency counter, Alternating Current (AC) voltmeter, and oscilloscope.

8. Build, test, troubleshoot, and document test results on an AM receiver capable of receiving a minimum of 15 stations.
9. Build, test, and troubleshoot the operation of class B power amplifiers.

Student Learning Outcomes:

SLO #1: Given a schematic diagram, students will be able to assemble, test and measure the circuit for its operational parameters.

Assessment Activities:

Four things determine your grade: Test #1, Test #2, Test #3 (Final), and Labs/Radio Project. The total for each item is converted into a percentage of the total grade as follows:

Test-1	25%
Test-2	25%
Test-3 (Final Exam)	25%
Labs (@ 5%) & AM Radio (@20%)	25%

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 all tests, 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 (AM Radio):

There are a total of 5 Labs worth 5% and 1 AM Radio project worth 20%. The first few weeks we have the simple labs, then you start building the radio. Please do NOT delay the start of the radio, it takes more time than you think.

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 not required, but helpful; 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, required: The TI-30x IIs (about \$15) has an engineering mode that allows you to enter and see the standard engineering units.

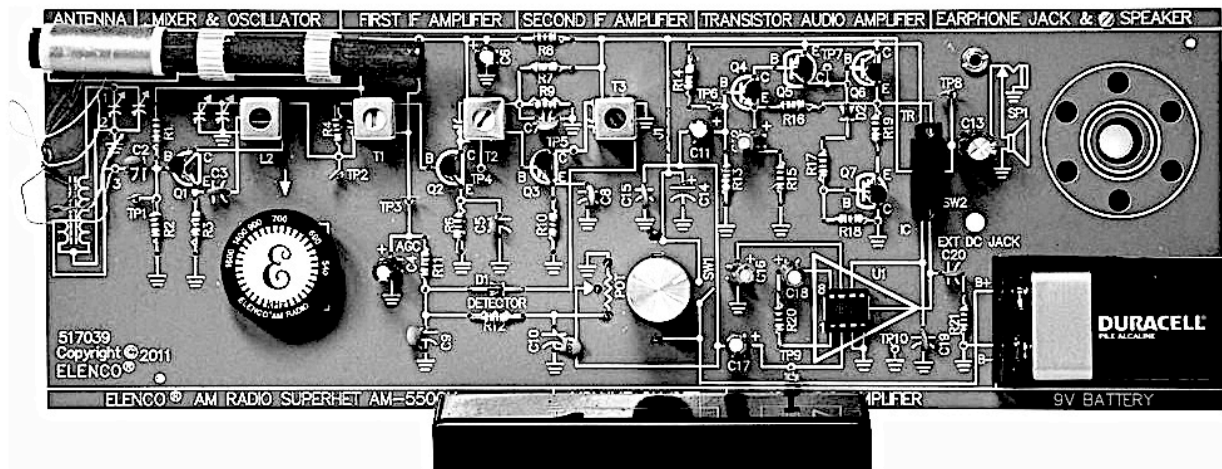
Class Number Assignment: All students will be assigned a one or two digit class number. This number will be used for checking out equipment, on labs, quizzes, and tests. The number makes it easier to keep track of things.

Lab Equipment: Many of the labs 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.

Late Labs: I will allow for late labs (labs past the end of the time), 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.** Loose papers will not be allowed, nor will any printed material.



Elenco AM Radio Kit MODEL AM-550CK

A major part of the labs is building the AM Radio. This kit costs around \$20 to \$26 depending on your source. The Toolroom also several kits that you may purchase at our cost. You'll have to ask the toolroom attendant as to the cost of the kit.

There is also a more expensive AM/FM version of the kit, Model AMFM108CK around \$34 to \$38, that you may build the AM side of the kit. The FM side may be saved for a project in ECHT-124 class.

For additional information see: <http://www.elenco.com/>

Tentative Schedule

Week 1: August 24 & August 26

Introduction & Orientation,
02AB Diodes & Zeners

No Labs for this week

Semiconductor Book Chap. 1 & 2

Week 2: August 31 & September 2

02AB Diodes & Zeners

Semiconductor Book Chap. 1 & 2

Week 3: September 7 Holiday (Labor Day) & September 9

02AB Diodes & Zeners

Semiconductor Book Chap. 1 & 2

Week 4: September 14 & September 16

02AB Diodes & Zeners

Semiconductor Book Chap. 1 & 2

Week 5: September 21 & September 23

05ABC Transistor, 06 Amplifiers

Semiconductor Book Chap. 4, 5, 6

Week 6: September 28 & September 30

05ABC Transistor, 06 Amplifiers

Semiconductor Book Chap. 4, 5, 6

>>> Test #1, September 30 <<<

Week 7: October 5 & October 7

05ABC Transistor, 06 Amplifiers

Semiconductor Book Chap. 4, 5, 6

Week 8: October 12 & October 14

05ABC Transistor, 06 Amplifiers

Semiconductor Book Chap. 4, 5, 6

Week 9: October 19 & October 21

05ABC Transistor, 06 Amplifiers

Semiconductor Book Chap. 4, 5, 6

Week 10: October 26 & October 28

08 JFETs, 09 MOSFETs

Semiconductor Book Chap. 7

Week 11: November 2 & November 4

08 JFETs, 09 MOSFETs

Semiconductor Book Chap. 7

>>> Test #2, November 4 <<<

Week 12: November 9 & November 11 Holiday (Veterans Day)

08 JFETs, 09 MOSFETs

Semiconductor Book Chap. 7

Week 13: November 16 & November 18

08 JFETs, 09 MOSFETs

Semiconductor Book Chap. 7

Week 14: November 23 & November 25

08 JFETs, 09 MOSFETs

Semiconductor Book Chap. 7

Week 15: November 30 & December 2

10 OP Amps

Semiconductor Book Chap. 8

Week 16: December 7 & December 9

December 7 = Review,

Review & FINAL EXAM

No Labs on the last week

>>>>> Thursday, December 9 = Final Exam <<<<<