

## **MUSC 1323 – Audio Electronics**

Audio Recording Program / Northwest College

CRN 72850 – Spring 2011

Spring Branch Campus –Rm#209 | Monday/Wednesday 6:00-9:00pm

2 Hour Lecture, 4 Hour Lab course / 96 Contact Hours per semester / 16 weeks

**Instructor:** David Wells, (713) 718-5615, david.wells@hccs.edu

**Office Hours:** 4:30pm to 5:30pm Mondays and Wednesdays in PAC Rm#417A

11am to 12pm Tuesdays and Thursdays in PAC Rm#417A

Other times available by appointment only

### **Course Description:**

Basic concepts in electricity, Ohm's Law, circuit analysis and troubleshooting audio problems. Includes soldering techniques and equipment maintenance.

**Prerequisites:** None

### **Course Goal:**

To provide the student with a significantly enhanced potential to be hired by a high-end studio as well as to increase their skill level as an independent recording engineer; to provide tools and knowledge which increase the earning potential of HCC graduates.

### **Student Learning Outcomes:**

The student will be able to:

1. Solve circuit problems using Ohm's Law.
2. Demonstrate effective troubleshooting techniques for audio problems.
3. Demonstrate appropriate preventive maintenance routines in recording and sound reinforcement.
4. Utilize proper soldering techniques.

### **Learning Objectives:**

Student will:

- 1.1 Describe the atomic properties involved with electricity and how this relates to conductors and insulators.
- 1.2 Demonstrate proper use of terminology associated with basic electronics such as voltage, current, and power.
- 1.3 Construct circuits using series and parallel connections.
- 1.4 Calculate voltage, current, and resistance within circuits by using Ohm's law.
- 2.1 Describe current flow and voltage drops within a DC circuit.
- 2.2 Simplify a DC circuit for analysis.
- 2.3 Define properties of AC signals such as amplitude, frequency, and phase.
- 2.4 Describe common AC signal measurement techniques.
- 2.5 Describe common passive circuit elements such as resistors, capacitors, inductors, and transformers.
- 2.6 Summarize units of measurement for passive components and coding schemes for values.

- 2.7 Explain the effect a diode has on DC and AC signals in a given circuit.
- 2.8 List common components found in power supplies and describe their operation.
- 3.1 Identify common measurement devices.
- 3.2 Demonstrate awareness of the potential dangers when using electricity and follow proper safety procedures when connecting or analyzing electronic circuits.
- 3.3 Demonstrate proper choice of components used in electronic devices based on their values and ratings.
- 3.4 Demonstrate proper use of a multimeter and oscilloscope.
- 4.1 Demonstrate proper use of soldering tools.
- 4.2 Demonstrate the ability to solder and de-solder connectors, wires, cables, printed circuit boards and components.
- 4.3 Describe the proper wiring scheme for various cable types.

### **SCANS or Core Curriculum Statement:**

The following workplace competencies and foundation skills have been designed into this courses curriculum:

- Participate as a team member
- Works with diversity
- Selects technology
- Reading

### **16 Week Calendar**

January 18:	Classes begin – Drop/Add/Swap Fee (\$15.00) begins – 70% refund
January 19:	Registration Ends – Last Day to Add/Swap Classes
January 21:	First class meeting
February 4 – 9:	25% refund
February 15:	Priority Deadline for Spring Completion of Degrees or Certificate
February 21:	NO CLASS (Presidents Day Holiday)
March 9:	Mid-Term Examination
March 14 and 16:	NO CLASS (Spring Break March 14 through 20)
April 14:	Last Day for Administrative/Student Withdrawals (4:30pm deadline)
April 14:	Veterans’s Advanced-Pay Applications Deadline for Summer Session
April 15:	Deadline for Spring Federal Student Loans
April 22 - 24:	Easter Holiday (all campuses closed)
April 27:	Kit Projects due (-10 points per class day late, score=0 after 5/4)
May 8:	Instruction Ends
May 9:	Final Examination (Final Examinations May 9 through 15)
May 20:	Grades Available to Students
June 30:	Financial Aid Priority Deadline for Returning Students

### **Instructional Methods:**

MUSC 1323 is a required course for all audio recording majors.

The class will be comprised of a variety of instructional methods including lectures, class discussions, computer-based simulations, lab assignments, and hands-on demonstrations.

As a student wishing to learn about audio electronics, it is your responsibility to read the textbook and handouts, perform the software exercises, submit assignments in a timely fashion, study for exams, participate in classroom activities, and attend class.

### **Student Assignments:**

Students will be required to complete the following assignments during the semester:

#### In-class Quizzes:

Pop quizzes will be given at the beginning of many classes. These quizzes will be comprised of multiple choice, true/false, short answer questions and other formats. Quizzes may occasionally be given at the end of class. An appropriate time limit will be assigned for each quiz.

Students who are not present when a quiz begins will not be allowed to take the quiz. No makeup quizzes will be given. The lowest quiz grade will be dropped for every full set of five quizzes administered.

#### Midterm Exam:

The Midterm Exam is cumulative from the beginning of the semester and is of a similar format to quizzes.

#### Final Exam:

The Final Exam is cumulative from the beginning of the semester and is of a similar format to quizzes.

#### Lab Exercises:

A variety of laboratory exercises will be performed in class to reinforce understanding of the various materials presented in lectures and reading assignments. Grading of labs is based on student participation and the achieving of desired outcomes. Additionally, students will construct cables outside of class time. Minimally acceptable construction quality is required for each cable or that cable will be rejected until its quality meets acceptable standards. Grading of cables is determined by attention to detail, quality and compliance with all instructions and proper techniques as demonstrated.

#### Project:

Each student will construct an electronic project from a commercially available kit. This kit must contain at least one active device (a transistor or integrated circuit) and a printed circuit board to which components are soldered. Grading is determined by the quality of construction, attention to detail, the student's ability to correctly follow assembly instructions and the functionality of the kit as intended by the designer.

#### Extra Credit:

One optional extra credit assignment is available to allow students to increase their final average, as well as to obtain a US Government issued Amateur Radio Operator license. Details will be discussed in class, as well as options regarding study material.

**Assessments:**

In-class Quizzes	20%
Midterm Exam	20%
Final Exam	20%
Lab Exercises	20%
Project	20%
TOTAL:	100%

Extra Credit may substitute for quiz average, midterm exam or final exam, but not for lab or project categories.

**Instructional Materials:**

*Understanding Basic Electronics*, Second Edition, by Banzhaf, published by ARRL  
*Basic Circuits Challenge*, simulation software by ETCAI, available on my learning web  
*DC Circuits Challenge*, simulation software by ETCAI, available on my learning web  
*AC Circuits Challenge*, simulation software by ETCAI, available on my learning web  
Additional materials are listed on the supplies sheet, available on my learning web  
Numerous handouts available on my learning web  
(Professor's learning web is at <http://learning.hccs.edu/faculty/david.wells/>)

**HCC Policy Statement – ADA**

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty is authorized to provide only the accommodations requested by the Disability Support Services Office.

**HCC Policy Statement – Academic Honesty**

A student who is academically dishonest is, by definition, not showing that the coursework has been learned, and that student is claiming an advantage not available to other students. The instructor is responsible for measuring each student's individual achievements and also for ensuring that all students compete on a level playing field. Thus, in our system, the instructor has teaching, grading, and enforcement roles. You are expected to be familiar with the University's Policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion.

Cheating on a test includes:

- Copying from another students' test paper;
- Using materials not authorized by the person giving the test;
- Collaborating with another student during a test without authorization;

- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of a test that has not been administered;
- Bribing another person to obtain a test that is to be administered.

Plagiarism means the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit.

Collusion mean the unauthorized collaboration with another person in preparing written work offered for credit. Possible punishments for academic dishonesty may include a grade of 0 or F in the particular assignment, failure in the course, and/or recommendation for probation or dismissal from the College System. (See the Student Handbook)

### **Class Attendance**

*Class Attendance - It is important that you come to class!* Attending class regularly is the best way to succeed in this class. Research has shown that the single most important factor in student success is attendance. Simply put, going to class greatly increases your ability to succeed. Class attendance is checked daily. You are expected to attend all lecture and labs regularly. You are responsible for materials covered during your absences. While the HCCS online attendance system may automatically drop you, your professor is not responsible for dropping you due to excessive absences. It is your responsibility to drop a course for nonattendance.

If you are not attending class, you are not learning the information. As the information that is discussed in class is important for your career, students may be dropped from a course after accumulating absences in excess of 12.5% hours of instruction. Absences from class include any total classes missed as well as excessive tardiness or leaving class early.

You may decide NOT to come to class for whatever reason. There is no differentiation for excused and unexcused absences, a missed class is a missed class. As an adult making the decision not to attend, there is no need to notify the instructor prior to an absence. However, excessive absences will cause you to suddenly find that you have "lost" the class.

Poor attendance records correlate with poor grades. If you miss any class, including the first week, you are responsible for all material missed. It is a good idea to find a friend or classmate who would be willing to share class notes or discussion or be able to hand in your paper if you unavoidably miss a class.

### **HCC Course Withdrawal Policy**

If you feel that you cannot complete this course, you will need to withdraw from the course prior to the final date of withdrawal. Before you withdraw from your course; please take the time to meet with the instructor to discuss why you feel it is necessary to do so. The instructor may be able to provide you with suggestions that would enable you to complete the course. Your success is very important. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than **SIX** total course withdrawals **throughout** their educational career in obtaining a certificate and/or degree.

To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor *may* “alert” you and HCC counselors that you might fail a class because of excessive absences and/or poor academic performance. It is your responsibility to visit with your professor or a counselor to learn about what, if any, HCC interventions might be available to assist you – online tutoring, child care, financial aid, job placement, etc. – to stay in class and improve your academic performance.

If you plan on withdrawing from your class, you **MUST** contact a HCC counselor or your professor prior to withdrawing (dropping) the class for approval and this must be done **PRIOR** to the withdrawal deadline to receive a “W” on your transcript. **\*\*Final withdrawal deadlines vary each semester and/or depending on class length, please visit the online registration calendars, HCC schedule of classes and catalog, any HCC Registration Office, or any HCC counselor to determine class withdrawal deadlines. *Remember to allow a 24-hour response time when communicating via email and/or telephone with a professor and/or counselor. Do not submit a request to discuss withdrawal options less than a day before the deadline.*** If you do not withdraw before the deadline, you will receive the grade that you are making in the class as your final grade.

### **Repeat Course Fee**

The State of Texas encourages students to complete college without having to repeat failed classes. To increase student success, students who repeat the same course more than twice, are required to pay extra tuition. The purpose of this extra tuition fee is to encourage students to pass their courses and to graduate. Effective fall 2006, HCC will charge a higher tuition rate to students registering the third or subsequent time for a course. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.

### **Instructor Requirements:**

Certain skills, specifically including the ability to solder well, make and repair cables and install a studio, are essential to a qualified audio engineer. For this reason, all four cable assignments must be submitted and graded “acceptable”, and the kit construction project must be submitted and awarded a passing grade, in order to pass the course. Regardless of other performance, a course grade of “F” will be awarded if the student fails to comply with any of these mandatory requirements.

### **Program/Discipline Requirements:**

None for this course.

### **HCC Grading Scale:**

90 - 100 = A  
80 - 89 = B  
70 - 79 = C  
60 - 69 = D  
Below 60 = F