Course Syllabus

MUSC 1423 (4:3:4)

Audio Electronics

Sound Technology Program

Creative Arts Department

Technical Education Division

Levelland Campus

South Plains College

Creative Arts Department - South Plains College - Levelland Campus

Course Syllabus: MUSC 1423

Course Title: Audio Electronics

Instructor: Stuart Moody

Office: CA 108

Phone: (806) 894-9611 x 2276 or 716-2276

Email: smoody@southplainscollege.edu

"South Plains College improves each student's life."

I. *General Course Information:*

A. **Description:** This course covers basic concepts in electricity, Ohm's Law, circuit analysis and troubleshooting audio problems. Topics also include soldering techniques and audio equipment maintenance.

B. **Course Learning Outcomes:** Upon successful completion of this course a student should have a grasp of the basic principles of electricity and the terms used to describe circuits. The student should be able to analyze a circuit and solve problems involving current, voltage, resistance and power. The student should be able to recognize common electronic components and understand their basic functions. The student should also be able to test components and circuit conditions with a digital multi-meter, and troubleshoot problems with common audio devices and systems. The student will also learn circuit board and audio cable assembly and soldering techniques.

C. **Course Competencies:** To receive a passing grade for this course a student must be able to master at least 60% of the skills and knowledge presented as assessed through tests and quizzes and written assignments given throughout the semester and ***must also score a 70 or higher on the sound system hands-on test, hands-on meter test, kit project, and cable project.*** Professionalism is also a factor in grading and must be demonstrated in all areas to receive the highest possible grade.

D. **Academic Integrity:** It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension. Students should refer to the SPC General Catalog, pg.22-23, regarding consequences for cheating and plagiarism (see "Academic Integrity" and "Student Conduct" sections).

E. **SCANS:** This course includes SCANS competencies C1, C3-C8, C10, C13,C15, C16, C18-C20. Foundation skills include F1-F3, F5, and F7 through F15. ***A key to these codes is found on the last 3 pages.***

II. *Specific Course/Instructor Requirements:*

A. **Textbook and Other Materials:** *No text required. Handouts and other study aids will be provided.*

B. **Attendance Policy:** Late penalties will be assessed as part of the "Professionalism Grade" (see grading policy). Missing class or arriving late is unprofessional and that type of behavior is not tolerated in professional work environments. Attendance may in-person or via live-streaming. All students will be expected to attend via one of these two delivery methods. Unavoidable absences will be considered at the instructor's discretion, but the student should make every effort to notify the instructor in advance in such a case. **Missed assignments or tests can only be made up if arrangements are made with the instructor prior to or the day of the absence. Call or email the instructor as soon as you know that you are not going to be able to attend either in person or via live stream.** This is a professional courtesy and is what an employer would expect of you if you had to miss work due to an unavoidable circumstance.

Excessive Absences/Drops: Two absences will be allowed without penalty. There will be a 10% penalty on the final grade for each absence thereafter. A student may be dropped once they no longer can achieve a passing grade, but this is at the instructor's discretion. To avoid receiving a grade of F for excessive absences, the student should formally withdraw from the course prior to the drop date.

C. **Assignment Policy:** Students will be assigned to complete two projects as outlined in this syllabus. Procedures will be demonstrated in class and the student will complete the projects during open lab time. Reading assignments from supplied handouts will be given in class. Students will be expected to read the assignment for understanding before the next class meeting. Students will be given written quizzes and exams to assess knowledge and understanding of the written material, lecture topics, and demonstrations. Students will be assigned to troubleshoot and maintain studio equipment and document their work. All assignments will have a deadline. Work handed in after the deadline will receive a zero.

D. **Grading Policy/Procedure:**

Projects-2	200 pts
Written Assignments/Documentation	100 pts
Written Tests-2 (1 midterm-1 Comprehensive Final)	200 pts
Hands-on Tests-2	200 pts
Quizzes	200 pts
Professionalism*	100 pts

*Each student will start with 100 professionalism points. This constitutes 10% of the total grade. Points will be deducted for behavior or work that is deemed by the instructor to be unprofessional. This includes but is not limited to: unapproved absences, lateness, failure to turn in assignments on time, sloppy or substandard work, uncooperative or negative attitude, disrespectful treatment of instructor or fellow students, inappropriate behavior, inappropriate attire, failure to turn off cell phones, misuse or abuse of equipment, sleeping in class, etc. The severity of the offense will determine the amount of points taken off and will be solely at the instructor's discretion. Repeated offenses will result in heavier penalties.

A = 90-100% Excellent 4 grade points per semester hour.
B = 80-89% Good 3 grade points per semester hour.
C = 70-79% Average 2 grade points per semester hour.
D = 60-69% Below Average 1 grade point per semester hour.
F = 0-59.9% Failing 0 grade points per semester hour.
I = Incomplete Not Computed
W = Student Initiated Withdrawal Not Computed
X = Administrative Withdrawal Not Computed

E. **Special Requirements:**

- ***Students must be able to troubleshoot a sound system within a 25-minute time limit. There will be 5 problems to identify and resolve. Each resolved problem is worth 20 points. The student must get a score of 70 or higher to pass this Hands-On Competency. A score of less than 70 will result in failure of the course. Retakes are permitted, but there is a 10-point cumulative penalty for each retake.***
- Students will assemble a passive direct box kit. For the student's safety, physical dexterity and hand-eye coordination must be demonstrated before the student will be allowed to operate the soldering equipment. A safety test will be conducted to assure that the student can complete this competency safely. Any student who cannot pass the safety test will be dropped from the course. Instructions will be given on basic soldering and assembly technique, but the student will be responsible for construction, testing, troubleshooting, and final assembly of the kit. All materials and tools will be provided and students will use open lab time to complete the project. ***The direct box must function in order to pass this competency. Submission of non-working devices will result in failure of this Competency and subsequently, failure of the course.*** The student may be given the opportunity to correct issues and resubmit the kit provided the kit is turned in by the deadline. Once the completed project has been graded and passes all requirements the student may take it home.
- Students will be provided materials and tools to construct an audio cable. The cable must meet professional standards for solder quality, correct wiring orientation, and must function in the intended application. ***Submission of a non-working cable will result in failure of this Competency and subsequently, failure of the course.*** The cable will be put to use in an SPC recording or sound reinforcement system unless otherwise specified.
- Students will be given a meter and an assortment of electronic circuit components and must correctly identify, measure and answer questions regarding these components. ***The student must score a 70 or better on this Competency. A score of less than 70 will result in failure of the course. Retakes are permitted, but there is a 10-point cumulative penalty for each retake.***
- Students may be required to use a computer and the Internet to complete lab work. Internet access is available in several labs throughout the campus including CA 135 and the Technology Center.
- Students need to know and practice the safe handling of tools, solder, and hot soldering irons.
- Students need to know and demonstrate electrical safety when troubleshooting devices or using a meter to test voltage or current.

III. *Course Outline: (not necessarily in this order)*

A. Basic Electricity
   1. Coulombs, Joules, Volts, Amps, Ohms, Watts
   2. Voltage, Current, Resistance, and Power
   3. Ohm's Law
   4. Series, Parallel and Series-Parallel Circuits

B. Components
   1. Component Identification; resistors, capacitors, diodes, transistors, etc.
   2. Component Function
   3. Component Testing

C. Troubleshooting Devices
   1. Cables
   2. Microphones
   3. Mixers
   4. Recorders
   5. Amplifiers and outboard effects
   6. Speakers

D. Troubleshooting Systems
   1. Signal Flow
   2. Logical Approach
   3. Process of Elimination
   4. Using the system as a troubleshooting tool
   5. Cable swapping
   6. Substitution

E. Soldering and Construction
   1. Audio Cable Building and Testing
   2. Circuit Board Assembly and Disassembly
   3. Project construction
   4. Project testing
   5. Project troubleshooting
   6. Final assembly

IV. *Additional Information*

For complete and up-to-date information on SPC policies regarding Intellectual Exchange, Disabilities, Non-discrimination, Title IX Pregnancy Accommodations, CARE Team, Concealed Carry, and COVID-19 protocols, please use the following link:

https://www.southplainscollege.edu/syllabusstatements/

V. *Attendance Policy*

Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become excessive as defined in the course syllabus.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a

student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

It is the student's responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.

VI. SCANS Key

Competencies

C1 Time Management
- Completion of projects by due dates
- Completion of assignments by deadlines

C3 Material/Facility Management
- Using available facilities to complete projects in time allotted
- Keeping track of tools and materials needed to build projects

C4 Working with Others
- Working with a partner to troubleshoot a system
- Quizzing each other on troubleshooting procedures

C5 Study/Evaluation Skills
- Testing the functionality of assembled components
- Using a meter to determine the status of a circuit
- Demonstrating knowledge of written material through quizzes and tests.

C6 Organizing and Maintaining Information
- Note taking
- Troubleshooting assignment documentation

C7 Interpreting and Communication Information
- Interpreting a signal flow chart
- Diagnosing and reporting equipment problems

C8 Computer Usage
- Using circuit simulation software to calculate volts, ohms, amps, watts, etc.

C10 Teaching Others
- Helping others with lab assignments

C13 Making Decisions
- Choosing which project to build
- Choosing the best tool for the job
- Determining the best method for troubleshooting a problem
- Deciding whether or not to attempt a repair or refer it to a more qualified repair technician
- Choosing the best method of repair

C15 Understanding Social, Organizational and Technological Systems

- Understanding signal flow in audio systems

C16 Monitoring and Correcting Performance

- Using test instruments and operational procedures to test student-built cables and audio devices.
- Troubleshooting of student-built devices.
- Diagnosis and reworking of student-built devices
- Using software circuit simulation to predict design parameters. Computer instantly checks predictions and allow students to try again if the prediction is incorrect.
- Students build cables and re-solder them if they do not meet standard
- Students perform hands-on tasks on troubleshooting tests and are allowed to re-take the test if a score of 70 is not attained

C18 Selecting the Appropriate Technology

- Using the right tool for the job
- Using the right materials for the job

C19 Applying Appropriate Technology to Tasks

- Using the right meter mode and properly using the meter for specific diagnostic tests

C20 Maintaining and Troubleshooting Technology

- Receiving hands-on experience in the proper use, handling, and maintenance, troubleshooting and basic repair of audio equipment

Foundation Skills

F1 Reading – locates, understands, and interprets written information

- Displaying comprehension of the functions of circuits and their components
- Interpreting circuit diagrams and signal flow charts

F2 Writing - communicates thoughts, ideas, information in written form

- Writing answers on written tests
- Providing documentation for troubleshooting assignments

F3 Arithmetic - basic computations, numerical concepts

- Analyzing and solving electronic circuit problems, calculating Ohm's Law formulas.

F5 Listening - receives, interprets, responds to verbal messages

- Listening to lectures, following verbal instructions
- Following verbal instructions regarding troubleshooting and building circuits
- Following verbal safety procedures

F7 Creative Thinking – generates new ideas

- Creative problem solving

F8 Decision Making–specifies goals, assesses risk, makes best choice

- Decides if a repair is within the student's ability
- Decides if attempting the repair is worth the time, money, and potential risk of making the problem worse or irreparably damaging the equipment
- Choosing to repair the device or send it to a repair technician

F9 Problem Solving - recognizes problems, implements plan of action

- Identify, isolate, and repair audio equipment

F10 Seeing Things in the Minds Eye–organizes/processes symbols, etc.

- Visualizing signal flow in a circuit based on schematic diagrams, signal flow charts and the actual circuit board.

F11 Knowing How to Learn - acquire and apply knowledge/skills

- Applying general troubleshooting procedures to a vast array of specific devices

F12 Reasoning - discovery and application of underlying principles

- Using charts to trace signal flow
- Applying electronics theory to real circuits to determine why they work or don't work

F13 Responsibility - perseverance toward goal attainment

- Troubleshooting expensive equipment without damaging it and following through until the problem is resolved
- Building a circuit and making sure it functions properly

F14 Self-esteem – believes in own self worth/has a positive view of self

- Building a cable or audio device that works and has a useful function
- Being able to figure out a problem and fix it

F15 Sociability - friendliness, adaptability, empathy, understanding, etc.

- Interacting with other students in labs and hands-on practice