



**Visual and Performing Arts Center of Excellence
Audio Recording Technology**

<https://www.hccs.edu/programs/areas-of-study/art--design/audio-recording-technology/>

MUSC 1323 – AUDIO ELECTRONICS | Lecture/Lab | #11986
Spring 2020 | 16 Weeks (01.21.2020-05.17.2020)
Hybrid | Spring Branch Rm 209 | T/Th 2 p.m. to 4:50 p.m.
3 Credit Hours | 96 hours per semester

Instructor Contact Information

| | | | |
|-------------|--|------------------|------------------------|
| Instructor: | David Wells | Cell Phone: | 713-417-0648 |
| Office: | PAC Building, Room 440 | Office Hours: | M/W 12-1pm, T/Th 5-6pm |
| HCC Email: | david.wells@hccs.edu | Office Location: | Spring Branch Campus |

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics.

Instructor's Preferred Method of Contact

Preferred Method of Contact: Email. In case of an emergency or urgent issue, please call or text me using the cell number listed. I will try to respond to emails within 24 hours Monday through Thursday; I will reply to weekend messages on Monday mornings.

What's Exciting About This Course

MUSC 1323 teaches a basic understanding of the electronic components and circuits used in the Audio Recording Industry. Topics include fundamentals of electricity, DC circuits, Ohm's Law, AC circuits, circuit analysis, fundamentals of sound and audio, common circuits used in audio devices, signal flow, soldering techniques, construction of cables and kits, troubleshooting and repair. Those who are interested and motivated will find that this course opens doors for them and enhances understanding of the technology we use every day.

My Personal Welcome

I have been involved in many facets of the electronics industry for most of my life as a repair technician, designer and prototyper. While owning a video production company, I custom designed and modified equipment in order to enhance its versatility and functionality. I have installed and engineered both live sound setups and studios. I was the Studio Manager for the Audio Recording and Filmmaking Program at Houston Community College for over nine years prior to accepting a position as a full-time instructor.

Students seeking a career in the Audio Recording industry will enhance their employment and earning potential by understanding basic electronics. Those with the ability to resolve signal flow issues, perform basic repairs and installation, have the ability to repair and make cables, and who utilize equipment with an understanding of its internal operation greatly increase their value to a studio owner and, for those who will own their studio, themselves.

The goal of this course is to give students the knowledge required to be hired into a higher-tier studio at a better rate of pay. This course is designed to help a student establish a successful career in the industry, not just a job. Those students who apply themselves will be more marketable, as they will stand above many others who do not have these skills.

Prerequisites and/or Co-Requisites

None. Successful completion of a basic algebra course is helpful, and you have a higher chance of success than students who have not done so. Having said that, many students successfully complete this course while learning the math from classroom examples and practice. Please carefully read and consider the repeater policy in the [HCCS Student Handbook](#).

Canvas Learning Management System

This class is a Hybrid class where in-class instruction is supplemented by on-line learning. We will use [Canvas](https://eagleonline.hccs.edu) (<https://eagleonline.hccs.edu>) for assignments, handouts, announcements and other activities. HCCS Open Lab locations may be used to access the Internet and Canvas. **USE [FIREFOX](#) OR [CHROME](#) AS THE INTERNET BROWSER.**

HCC Online Information and Policies

Here is the link to information about HCC Online classes including the required Online Orientation for all fully online classes: <http://www.hccs.edu/online/>

Scoring Rubrics, Sample Assignments, etc.

Look in Canvas for the scoring rubrics for assignments, samples of class assignments, and other information to assist you in the course. <https://eagleonline.hccs.edu/login/ldap>

Instructional Materials

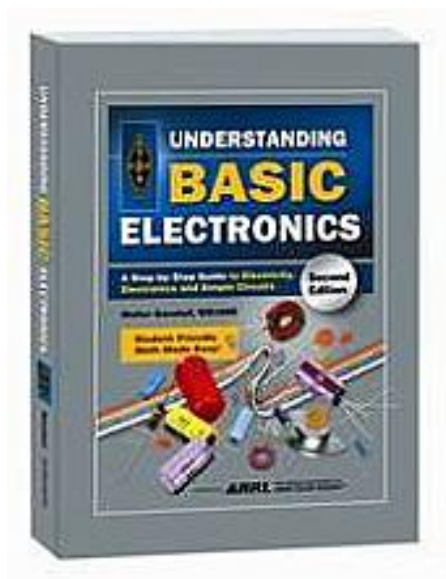
Textbook Information

The textbook for this course is:

Understanding Basic Electronics (2nd Edition), by Walter Banzhaf, published by ARRL. Available at the Spring Branch campus bookstores, you may also purchase it used online at Amazon and other resale book sellers, as well as from <http://www.arrl.org/shop/Understanding-Basic-Electronics/>.

ISBN: 978-0-87259-082-3

The book is not comprehensive and much of your required reading will be provided through Eagle Online Canvas where you will find handouts and other materials needed for the course.



Other Instructional Resources

Tutoring

HCC provides free, confidential, and convenient academic support, including writing critiques, to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for services provided.

Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

Course Overview

MUSC 1323 is a required course in the Audio Recording Technology Program that covers the basic concepts, theory and circuits used in the industry. Overall, the course goal is to prepare audio students to enter the work place with a high level of competence to successfully qualify for the better paying jobs in the industry at higher tier studios. The class uses a variety of instructional methods including required reading, lectures, class discussions, hands-on demonstrations and demonstration of solder skills learned by each student in building cables and an electronic kit.

Core Curriculum Objectives (CCOs)

HCC offers specified courses that satisfy the following core objectives:

Critical Thinking

Communication Skills

Quantitative and Empirical Literacy

Teamwork

Social Responsibility

Personal Responsibility

To learn more go to: <https://www.hccs.edu/programs/catalog/academic-information/>

This course integrates the following workplace competencies and foundation skills:

Managing Resources: Time, Materials, Space

Exhibiting Interpersonal Skills: Work in team, Lead work teams, Negotiate with others

Working with Information: Acquire and evaluate data, Organize and maintain information, Interpret and communicate data, Process information

Applying Systems Knowledge: Understand systems

Using Technology: Apply technology to specific tasks

Demonstrating Basic Skills: Reading, Writing, Listening

Demonstrating Thinking Skills: Creative thinking, Problem solving, Seeing with the mind's eye

Exhibiting Personal Qualities: Individual responsibility, Sociability, Self-management, Integrity

Program Student Learning Outcomes (PSLOs)

Can be found at:

<https://www.hccs.edu/programs/areas-of-study/art--design/audio-recording-technology/>

Course Student Learning Outcomes (CSLOs)

Student Learning Outcomes

Upon completion of MUSC 1323, the student will be able to:

1. Solve circuit problems using Ohm's Law.
2. Demonstrate effective troubleshooting techniques for basic audio problems.

3. Demonstrate appropriate preventive maintenance routines in recording and sound reinforcement.
4. Utilize proper soldering techniques.

Learning Objectives

Students 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.

Student Success

Expect to spend at least twice as many hours per week outside of class as you do in class studying the course content. Additional time will be required for written assignments. The assignments provided will help you use your study hours wisely. Successful completion of this course requires a combination of the following:

- Reading the textbook
- Attending class in person
- Completing assignments
- Participating in class activities

There is no short cut for success in this course; it requires reading (and probably re-reading) and studying the material using the course objectives as a guide.

Instructor and Student Responsibilities

As your Instructor, it is my responsibility to:

- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through learner-centered instructional techniques
- Provide a description of any special projects or assignments
- Inform students of policies such as attendance, withdrawal, tardiness, and making up assignments
- Provide the course outline and class calendar that will include a description of any special projects or assignments
- Arrange to meet with individual students before and after class as required

As a student, it is your responsibility to:

- Attend class in person
- Participate actively by reviewing course material, interacting with classmates, and responding promptly in your communication with me
- Read and comprehend the textbook
- Complete the required assignments and exams
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts, and all assignments
- Attain a raw score of at least 50% on the departmental final exam
- Be aware of and comply with academic honesty policies in the HCCS Student Handbook

Assignments, Exams, and Activities

Student Assignments

Assignments have been developed that will enhance your learning.

Quizzes

Scheduled quizzes and pop quizzes may be given at the beginning or end of class.

Appropriate time limits will be assigned for each quiz. Students must be present when a quiz begins. NO makeup quizzes will be given.

Circuits Challenges (software exercises)

Tutorial software is used by students to reinforce understanding of materials presented in lectures and reading assignments. Completion of each assigned exercise with a grade of 90% is required. Appropriate circuit challenges must be done as related topics are covered in class. Due dates will be set for submission of certificates for credit.

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 achieving 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 without credit until its quality meets acceptable standards. An acceptable cable will demonstrate the student's attention to detail, quality of construction and use of the proper assembly and soldering techniques. Due to the fact that our industry requires these specific skills, **ALL FOUR ASSIGNED CABLES MUST BE TURNED IN AND JUDGED ACCEPTABLE OR A GRADE OF ZERO WILL BE ASSIGNED TO THIS CATEGORY.**

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 full functionality as intended by the designer and noted in the kit's documentation, which must be submitted with the kit when it is presented for grading. Due to the fact that our industry requires certain specific skills, **A FULLY FUNCTIONAL, PROPERLY CONSTRUCTED KIT MUST BE SUBMITTED BY THE DEADLINE OR A GRADE OF ZERO WILL BE ASSIGNED TO THIS CATEGORY.**

Any assignment not turned in by the due date will either not be accepted or subjected to a late penalty. Hard deadlines may be assigned. Extensions may be granted on a case-by-case basis.

Departmental Orientation

In order to access the equipment and other resources (computer labs...etc) at HCC, the Audio Department requires that you complete orientation. Failure to complete the orientation and the required form within it will result in a reduction in your grade, denial of labs, studios, and use of equipment. There will be **no make-ups or extended dates** to complete orientation.

Orientation will be held during regular class time in room 209 on January 23

In-Class Activities

In-class activities will be discussed and defined during class depending on the topic as outlined in the schedule below.

Extra Credit

Amateur Radio Licensing

It has been shown that licensed participants in Amateur Radio (ham radio) exercise and refine more advanced electronic skills in a pathway to lifelong learning. Extra credit for this course is to successfully pass the examination for the Technician class (entry level) Amateur Radio license, granted by the Federal Communications Commission of the United States government. Students already licensed will receive credit by upgrading to the next higher class of license. Additional extra credit may be awarded to students who also pass the exam for a higher class license. Examinations will be administered by a team of at least three credentialed Volunteer Examiners as required by law. Links to study materials are provided on my learning web.

Grading Formula

For each assignment, the instructions will define what the Instructor expects from the student in order to earn a "C" grade. This will give the student an idea of what the instructor considers the "average". The instructor will give higher grades based on demonstration of knowledge and understanding and even higher grades based on innovation and creativity related to the topic. This class should showcase your enthusiasm and demonstrate your skills/knowledge and ability to perform in the workforce.

Your final grade will be based on the following proportions:

1. Attendance – 10%
2. Quizzes – 30%
3. Circuit Challenges – 10%
4. Cables – 30%
5. Project Kit – 20%
6. Extra Credit Amateur Radio License - TBA

| Grade | Total % |
|-------|---------|
| A | 90-100 |
| B | 80-89 |
| C | 70-79 |
| D | 60-69 |
| F | <60 |

Incomplete Policy:

In order to receive a grade of Incomplete ("I"), a student must have completed at least 85% of the work in the course. In all cases, the instructor reserves the right to decline a student's request to receive a grade of Incomplete.

HCC Grading Scale can be found on this site under Academic Information:
<http://www.hccs.edu/resources-for/current-students/student-handbook/>

Course Calendar

Tentative, Subject to Change

| Week | Dates | Topic/What's due | Homework |
|------|--------------------------------------|--|---|
| 1 | 01/21/20 01/23/20 | Course Orientation Introductions Demonstrations DC Principles: Voltage, current, resistance and power | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #1 |
| 2 | 01/28/20 01/30/20 | DC Principles: Voltage, current, resistance and power | <ul style="list-style-type: none"> • Read textbook assignment • Read Handout #1 • Begin Basic Circuit Challenges |
| 3 | 02/04/20 02/06/20 | Resistors in Series and Parallel Cable #1 due | <ul style="list-style-type: none"> • Read textbook assignment • Read Handout #1 • Finish Basic Circuit Challenges • Begin DC Circuit Challenges |
| 4 | 02/11/20 02/13/20 | Resistor Networks Troubleshooting Cable #2 due | <ul style="list-style-type: none"> • Read textbook assignment • Read Handout #1 • Finish DC Circuit Challenges |
| 5 | 02/18/20 02/20/20 | Light Emitting Diodes Cable #3 due | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #2 |
| 6 | 02/25/20 02/27/20 | Properties of Sound and Audio Introduction to AC Introduction to Oscilloscopes Cable #4 due | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #3 |
| 7 | 03/03/20 03/05/20 03/07/20 | Oscilloscope Usage Hands-on tests Greater Houston Hamfest - Rosenberg | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #3 |

| | | | |
|----|----------------------|---|--|
| 8 | 03/10/20 03/12/20 | Inductance Capacitance Reactance Low Pass and High Pass Filters | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #3 |
| 9 | 03/24/20 03/26/20 | Second Order Filters Resonance | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #3 |
| 10 | 03/31/20 04/02/20 | Introduction to Semiconductors Transistors The Common Emitter Amplifier | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #5 |
| 11 | 04/07/20 04/09/20 | Operational Amplifiers | <ul style="list-style-type: none"> • Read Textbook assignment • Study Handout #6 |
| 12 | 04/14/20 04/16/20 | Power Supplies Project due | <ul style="list-style-type: none"> • Read Textbook assignment • Read Handout #4 |
| 13 | 04/21/20 04/23/20 | Digital Logic | <ul style="list-style-type: none"> • Read Textbook assignment • Study Handout #7 |
| 14 | 04/28/20 04/30/20 | Digital Logic Computers | <ul style="list-style-type: none"> • Read Textbook assignment |
| 15 | 05/05/20 05/07/20 | Computers | <ul style="list-style-type: none"> • Alternate Reading Assignments TBA |
| 16 | 05/12/20 | Final Exam Week One Class Meeting ONLY | <ul style="list-style-type: none"> • Final Deadline for All Late Assignments |

The OFFICIAL HCCS Calendar is at www.hccs.edu/student-experience/events-calendar
There are tabs for Academic Calendar, Holiday Calendar and Events at HCC.

LAST DAY TO DROP ANY 16-WEEK CLASS IS APRIL 6, 2020 -- CANNOT DROP AFTER!

Syllabus Modifications

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes.

Instructor's Practices and Procedures

Missed Assignments

Assignments are due at the beginning of class.

There are NO makeups for a missed quiz. Out of every integer multiple of five quizzes one quiz grade (the lowest) will be dropped at the end of the semester prior to calculating your final grade for the course.

If you are unable to turn in any assignment on time it may not be accepted. This is at the instructor's sole discretion on a case by case basis. If it is accepted, your assignment will be penalized 25% for each class day it is late.

NO MATERIALS WILL BE ACCEPTED AFTER CLASS TIME ON THE LAST DAY OF CLASS

Academic Integrity

Cheating, plagiarism, collusion, will not be tolerated. You are expected to complete all the assignments on your own. Scholastic Dishonesty will result in a referral to the Dean of Student Services. See the link below for details.

Here's the link to the HCC information about academic integrity (Scholastic Dishonesty and Violation of Academic Scholastic Dishonesty and Grievance):

<http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/>

Attendance Procedures

Attendance and participation are graded. If you arrive more than 30 minutes late, or leave more than 30 minutes before the end of class, you will not receive credit. Students missing time totaling more than 12.5% of scheduled class time will be dropped from the course. This equates to 12 missed hours or four class sessions. You are responsible for any material missed.

If you stop showing up to class, you will receive a grade of FX showing the last date that you attended. This will affect your GPA and it may reduce your financial aid.

Any student who encounters difficulties during the semester that prohibits them from completing the coursework, but who wants the opportunity to finish the work in the following semester, **must** get Instructor approval in order to receive an Incomplete for the semester. A schedule for completing the work the following semester will be set up with the Instructor and if the materials are not received within that timeframe, the grade will automatically be converted to an F, thus affecting your GPA. Students should note that Incompletes are granted only in extreme and unusual circumstances.

Student Conduct

Participation in this class is also graded based upon your participation in class discussions, exercises and labs.

Despite this being a school environment, you approach this class as you would any job. Conduct yourself professionally and treat your fellow students and Instructor as professional colleagues. Each of your assignments is an opportunity to explore your talent and build your skills as a professional. Treat your projects as jobs, with your Instructor as your “client.”

This is an industry built on relationships, networking, and communication. Your behavior is just as important, if not more, as the talent and skill you demonstrate.

Any disruptive behavior will not be tolerated. Any disagreements within class and any external issues affecting your behavior in class will be dealt with individually and not at the expense of the class’s time and focus. Repeated disruptive behavior will result in withdrawal from the class.

Please read the HCCS Policy Letter shown in Canvas relating to drug and alcohol use on campus.

Electronic Devices

The use of any electronic device during classtime is strictly prohibited. Cell phones are to be turned off or put on silent for the duration of the class. If you need to take or make an emergency phone call, please step outside. Headphones are prohibited unless listed as an accommodation in a letter from disAbility Services. Laptops and tablets MAY be allowed for notetaking on a case-by-case basis, and no other purpose. NO ELECTRONIC DEVICE, OTHER THAN A DEDICATED-PURPOSE SCIENTIFIC CALCULATOR, MAY BE USED DURING A QUIZ.

Audio Recording Technology Program Information

For more information about the Audio Recording Technology Program:

HCC Certificates & Degrees: <https://www.hccs.edu/programs/areas-of-study/art--design/audio-recording-technology/>

HCC Policies

Here’s the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> In it you will find information about the following:

- Academic Information
- Academic Support
- Attendance, Repeating Courses, and Withdrawal
- Career Planning and Job Search
- Childcare
- disAbility Support Services
- Electronic Devices
- Equal Educational Opportunity
- Financial Aid TV (FATV)
- General Student Complaints
- Grade of FX
- Incomplete Grades
- International Student Services

- Health Awareness
- Libraries/Bookstore
- Police Services & Campus Safety
- Student Life at HCC
- Student Rights and Responsibilities
- Student Services
- Testing
- Transfer Planning
- Veteran Services

EGLS³

The EGLS³ ([Evaluation for Greater Learning Student Survey System](#)) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term.

<http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/>

Campus Carry Link

Here's the link to the HCC information about Campus Carry:

<http://www.hccs.edu/departments/police/campus-carry/>

HCC Email Policy

When communicating via email, HCC requires students to communicate only through the HCC email system to protect your privacy. If you have not activated your HCC student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

Housing and Food Assistance for Students

Any student who faces challenges securing their foods or housing and believes this may affect their performance in the course is urged to contact the Dean of Students at their college for support. Furthermore, please notify the professor if you are comfortable in doing so.

This will enable HCC to provide any resources that HCC may possess.

Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

disAbility Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including long and short term conditions, mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and

state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
(713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu
<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

Office of the Dean of Students

Contact the office of the Dean of Students to seek assistance in determining the correct complaint procedure to follow or to identify the appropriate academic dean or supervisor for informal resolution of complaints.

<https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/>

Department Chair Contact Information

Michael Cohn
Michael.cohn@hccs.edu Campus Telephone 713.718.6523