

Division of Natural Sciences and Horticulture Physics Department

http://learning.hccs.edu/programs/physics

PHYS 2325: University Physics I | Lecture | #23387

Fall 2020 | 16 Weeks (8.24.2020-12.13.2020) Online | | TuTh 03:30 p.m.- 4:50 p.m. 3 Credit Hours | 48 hours per semester

Instructor Contact Information

Instructor: Aqiang (AQ) Guo Office Phone: 713-718-2799 Office: Office Hours: By appointment

HCC Email: agiang.guo@hccs.edu Office Location: Online-through canvas

Online meeting time Tuesday and Thursday: 3:30 pm - 4:50 pm

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 discuss course topics with you.

How to join the WebEx meeting:

1. Log into your canvas account. 2. Go to the class. 3. Click on Cisco WebEx. 4. Click on "Virtual meeting". 5. Click on join, then choose open the meeting.

Instructor's Preferred Method of Contact

- 1. Canvas Inbox
- 2. Canvas Announcements
- 3. HCC Email

Students must use their HCCS.edu email or Canvas Inbox for communication. I will not respond to any other form of email like Gmail. The preferred contact is through Canvas Inbox. Please allow sufficient time for a response. I will respond to emails within 24 hours Monday through Friday. I will reply to weekend messages on Monday mornings.

I will be posting messages for the class in "announcements". You should check this often, especially before an exam.

What's Exciting about This Course

Physics is the study of the entire universe and everything in it, from the smallest subatomic particles to enormous objects such as planets, stars and even entire galaxies. Physics is how we describe the motion of objects, topics such as electricity, magnetism and light and study energy in its various forms (for example, mechanical or thermal). It is amazing that the universe works in a way that we, as curious human beings, can describe, explain and even predict how phenomena occur in the world around us. Certainly, this sounds exciting to me and hopefully to you as well!

My Personal Welcome

Welcome to University Physics I—I'm delighted that you have chosen this course! One of my passions is to know as much as I can about the universe around me, and I can hardly wait to pass that knowledge on. I will present these physical principles in the most exciting way I know, so that you can grasp the concepts and apply them now and hopefully throughout your life.

As you read and wrestle with new ideas and facts that may challenge you, I am available to support you. The fastest way to reach me is by my HCC email. The best way to really discuss issues is in person and I'm available during posted office hours to tackle your questions. My goal is for you to walk out of the course with a better understanding of yourself and the universe around you. So please visit me or contact me by email whenever you have a question.

Prerequisites and/or Co-Requisites

PHYS 2325 requires college-level reading, writing and math skills, including calculus. You are most likely to succeed if you have already taken and placed into GUST 0341 (or higher) in reading and be placed into MATH 2413 (or higher). If you have enrolled in this course having satisfied these prerequisites, you have a higher chance of success than students who have not done so.

Please carefully read and consider the repeater policy in the HCCS Student Handbook.

Canvas Learning Management System

This course will use Canvas for exams, quizzes, home-works etc. Course material including Syllabus, Lecture notes, Lecture Video records, Homework problems, Pre-Class Quizzes, Practice problems, Sample solutions, Past exams, Formula sheet, notices, links to useful physics material etc. will be posted on Canvas.

Messages for the class will be posted in "Announcements" in canvas, so check that often, especially before an exam.

The Syllabus is also available on the Learning Web.

As HCCS campus locations are closed, you have to use your own computer and internet. **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.

Homework sets, quizzes and exams will consist of problems on canvas, for which the answers have also to be entered in canvas. To account for minor rounding errors, answers within a few percent of the exact will be considered correct. To minimize rounding errors, do all calculations to at least 5 digits, do not round off during the intermediate calculations, and round the final answer to three or four significant figures.

Some exams may also be show-work type, which will be manually graded. For such exams, marks are usually reserved for:

- Making a sketch
- Writing the equations used
- Unit conversions, if required
- Calculation of intermediate values, and
- Correct units in the final answer.

You must write the equation/s that you are using before plugging in the numbers. Your answer must not contain too many or too few significant figures. Use four to five significant figures in the intermediate calculations and round off the final result to three significant figures. Do not round off during the intermediate calculations. You may lose points if you write 5 or more significant figures in the final answer, unless the question requires it. You may also lose points if your final answer is more than a few percent off from the correct answer, so do not round the final answer to less than three significant figures. Just giving the answer without showing the working usually earns no points.

The points assigned to each question is mentioned in the Homework sets and guizzes.

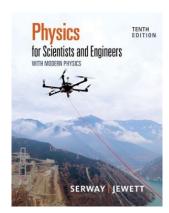
Instructional Materials

Computer Requirements

Since this is an online course, you will need to have a Computer or Laptop and an internet connection. Make sure they have a camera / webcam as it would be needed in the online class meetings and exams.

You must have Webcam facility available with you. All Exams are conducted using Lock Down Browser and Respondous Monitor. Having a computer integrated webcam is a substitution for external webcam. You are not allowed to take Quizzes & Exams without having installed Lock Down Browser (LDB). You don't have to pay for this service. If you have LDB downloaded from a different institution, it will not work at HCC. LDB is unique for each institution.

Textbook Information



The textbook listed here is used for this course:

Physics for Scientists and Engineers

10th Edition (2019)

Raymond A. Serway and John W. Jewett, Brooks/Cole, USA.

ISBN-10: 1-337-55329-8 ISBN-13: 978-1-337-55329-2 (Earlier editions may also be used)

Chapters 1 to 14, 18-21

Tutoring

HCC provides free, confidential, and convenient academic support, 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. Tutoring may be both online or in-person in most campuses. 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 peerassisted 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

First semester of a two semester, calculus-based physics course designed specifically for chemistry, physics, and engineering majors. Topics include principles and applications of classical mechanics, kinetic theory, fluid flow, and thermal physics, with emphasis on problem solving.

Core Curriculum Objectives (CCOs)

PHYS 2325 satisfies the physical science requirement in the HCCS core curriculum. The HCCS Physics Discipline Committee has specified that the course address the following

core objectives:

- **Critical Thinking**: Students will demonstrate the ability to engage in inquiry and analysis, evaluation and synthesis of information, and creative thinking by demonstrating problem solving skills on homework and exams.
- **Communication Skills**: Students will demonstrate effective development, interpretation and expression of ideas through written, and visual communication.
- **Quantitative and Empirical Literacy**: Students will demonstrate the ability to draw conclusions based on the systematic analysis of topics using observation, experiment, and/or numerical skills by completing textbook reading assignments, completing assignments, and answering questions on quizzes and/or exams.

Program Student Learning Outcomes (PSLOs)

- 1. To provide the student a basic and practical understanding of physics (basic qualitative and quantitative concepts, and systematic problem-solving strategies) and recognize its relevance in our daily lives.
- 2. To prepare students to meet with success in higher level Physics and other science courses when they transfer to four-year universities.
- 3. To prepare students for professional programs requiring a mastery of General Physics, such as Physics, Chemistry, Mathematics and engineering.

Course Student Learning Outcomes (CSLOs)

Upon completion of PHYS 2325, the student will be able to:

- 1. Use vector analysis and calculus to solve kinematics and dynamics problems.
- 2. Apply Newton's laws of motion to analysis of dynamics problems.
- 3. Relate the concept of total work done to the change in kinetic energy of a particle.
- 4. Identify different forms of energy and transformation of energy.
- 5. Apply conservation laws (conservation of energy and linear momentum) to the analysis of dynamics of a particle or a system of particles.
- 6. Apply Newton's laws of motion to rotational motion.
- 7. Understand basics of Thermodynamics

Learning Objectives

Upon successful completion of this course, students should be able to:

- 1.1 Solve one and two-dimensional kinematics problems.
- 1.2 Analyze motion of free-falling object, projectile motion, and particle in circular motion.
- 2.1 Use Newton's Laws of motion in solution of dynamics problems.
- 2.2 Draw free body diagrams in situations involving forces.

- 3.1 State the Work Energy -Theorem and apply it to the analysis of dynamics problems.
- 4.1 Define potential energy and relate it to conservative forces;
- 4.2 Relate internal energy to the work done by non conservative forces.
- 5.1 State the Law of Conservation of Energy.
- 5.2 Use the Law of Conservation of momentum in the analysis of collisions.
- 6.1 Solve simple problems involving rotational dynamics.
- 6.2 State the conditions for equilibrium and apply them to solution related to equilibrium.
- 7.1 Solve basic thermodynamics problems.

Student Success

Expect to spend an average of about five to six hours per chapter, including studying the online lectures, attending the online sessions and doing the homework problems. Successful completion of this course requires a combination of the following:

- Studying the online lectures before coming to class
- Attending online class in person
- Completing assignments on time
- Solving as many end-of-chapter problems as possible

There is no short cut for success in this course; it requires studying the material and solving problems using the course objectives as your 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
- Be aware of and comply with academic honesty policies in the <u>HCCS Student</u> Handbook

Assignments, Exams, and Activities

Homework Assignments

Problems are assigned on Canvas for every chapter that is covered.

Homework (HW) sets will be posted on Canvas for each chapter. You need to open them, solve the questions and enter your answer. They will be graded only after you 'submit' the answers.

The HW are due Sunday night after chapter completes (except in the last week).

System will stop accepting any submissions on the day of your final exam at 11:59 pm.

Even though the system will let you submit the HW up to the "Available Until" date and time, it will limit your points to 75% of the maximum right after the due date and time, and to 50% one day later, so do not put it off for the last minute. You can submit a late homework (for 50% of max. points) until the day of the final exam.

For each HW you will have two attempts, and the higher of the two will be used. However, if the first attempt is on time, but the second is after the due date/time, Canvas will consider it late, and late penalty will be applied.

If you wish to try the HW problems again for practice (e.g. before an exam), do the "PRACTICE PROBLEMS". They have the mostly same questions as the homework sets, but are not graded, and you have unlimited attempts.

Each chapter module also has "SOLVED PRACTICE PROBLEMS", which you can use as a guide to solve the homework problems.

Exams

Exams will be on canvas in which we will use Respondus Lockdown Browser and Respondus Lockdown Monitor. These will restrict the use of your laptop to the exam and will film you as you take the exam and report un-wanted activity. Hence you must have a computer with built-in or separate webcam on which you can download the software required by Respondus.

A formula sheet is available in Canvas. Print it out and use it during the course. You can also use it during the exams. The purpose of the exam is to test knowledge of the principles

and theories presented during class. Exam problems will be similar (not the same!) as the Review Problems and problems from the homework.

There are no make-up exams, therefore, make every effort to take the Term exams on their scheduled date. If a Term exam is missed, the grade in the final exam will replace it, for at most one exam. If you do not miss any of the Term exams, I will replace your lowest Term exam score with your final exam score if the final exam grade is higher. This is intended to provide you a "second chance" if you do not do well on a particular exam. Remember that the final exam will be comprehensive (meaning that it will cover all the material from the whole semester, not just the last part). Please note that all students are required to take the final (no student can be exempted).

The homework and quiz average (20%) cannot be dropped or replaced by the final exam grade.

In-Class Activities

The class will be run as a Flipped Class, i.e. the lectures are available on canvas, which you are **required** to see before the class. These videos are almost exactly the same as what we would otherwise do online. In class, we will briefly review the topics for the day, and then solve some problems. During the lectures you may have you questions ready so that I can spend some time to answer your questions.

Pre-Class Quizzes

Pre-Class Quizzes (PCQ) sets will be posted on Canvas for each chapter. You need to open them, solve the questions and enter your answer. They will be graded only after you 'submit' the answers. The due date is the same day of whatever the topics should be finished under the course schedule. The PCQ quiz normally is given one week time window. If you study the lecture notes and watch the lecture videos, you should have no difficulty to finish the quiz. The grade policy for late submission is similar to the HW late policy.

Final Exam

All students will be required to take a comprehensive final exam. Students who are absent from the final exam without a valid and compelling reason will receive a failing course grade. The final exam will be comprehensive, i.e. includes all chapters done in class.

All exams will be online, with the use of the Lockdown Browser and Lockdown Monitor.

These require that your laptop or computer should have a camera.

Grading Formula

The final grade is based on the total possible score of 100%, which the student can accumulate from all tests, class work, homework, and the final exam.

The overall score is based on the following:

Semester Start Quiz
Homework
Pre-Class Quiz
5%
15%
10%

• Three mid-term exams 52.5% (17.5% each)

• Final Exam 17.5% (Comprehensive and compulsory)

Grading Scale: A = 90 - 100%

B = 80 - 89% C = 70 - 79%D = 60 - 69%

F < 60

Incomplete Policy:

A student who but misses the final exam due to unavoidable circumstances (e.g. a serious accident or hospitalization, etc.) may receive a grade of "Incomplete" ("I"). The student must provide proof of these circumstances before or within 24 hours of the exam. Such students would have to take the final exam in the following semester.

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

Course Calendar

Online meeting time Tuesday and Thursday 03:30 pm - 4:50 pm						
Wk	DATE	TOPICS	HW	DUE DATE		
1	Aug-25	Review of Syllabus				
		General quiz				
1	Aug-27	Ch.1- Physics and Measurement	HW	due 8/31		
2	Sep-01	Ch.2- Motion in One Dimension	HW	due 9/07		
2	Sep-03	Ch.3- Vectors	HW	due 9/07		
M	Sep-07	Labor Day Holiday				
3	Sep-08	Ch.4- Motion in Two Dimensions				
3	Sep-10	Ch.4- Motion in Two Dimensions	HW	due 9/14		
4	Sep-15	Ch.5- Newton's Laws of Motion				
4	Sep-17	Ch.5- Newton's Laws of Motion	HW	due 9/21		
5	Sep-22	Exam-1 (ch: 1, 2, 3, 4, 5)				
5	Sep-24	Ch.6- Circular Motion and Newton's Laws	HW	due 9/28		
6	Sep-29	Ch.7- Energy of a SystemHW due 10/05				
6	Oct-01	Ch.8- Conservation of Energy	HW	due 10/05		
7	Oct-06	Ch.9- Linear Momentum and Collisions				
7	Oct-08	Ch.9- Linear Momentum and Collisions	HW	due 10/12		
8	Oct-13	Ch.10- Rotation of a Rigid Object				
8	Oct-15	Ch.10- Rotation of a Rigid Object	HW	due 10/27		
9	Oct-20	Ch.12- Static Equilibrium				
9	Oct-22	Ch.12- Static Equilibrium	HW	due 10/27		
10	Oct-27	Ch.11- Angular Momentum				
10	Oct-29	Exam-2 (ch: 6, 7, 8, 9, 10, 12)				
11	Nov-03	Ch.11- Angular Momentum		due 11/09		
11	Nov-05	Ch.13- Universal Gravitation		due 11/11		
12	Nov-10	Ch.14- Fluid Mechanics (Pressure, Pascals Law, Buoyancy)				
12	Nov-12	Ch.14- Fluid Mechanics (Continuity & Bernoulli Eqr	1.)	HW due 11/18		

13	Nov-17	Ch.18 and Ch.20 Temperature and Ideal Gasses	HW due 11/23	
13	Nov-19	Ch.19 Heat and the First Law of Thermodynamics	HW due 11/25	
14	Nov-24	Ch.21- Heat Engines	HW due 11/30	
14	Nov-26	Thanksgiving Holiday		
15	Dec-01	Exam-3 (ch: 11, 13, 14, 18, 19, 20, 21)		
15	Dec-03	Review (Q/A)		
16	Dec-8	Final Exam (2325-23387-3:30PM) (start from 3:00 PM)		

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.

Time/date for correcting grade mistakes

If students think the instructor made mistakes about their grades, they should contact the instructor as soon as possible. The instructor will explain why he give the grade(s), or make proper changes if the instructor did make mistake(s).

- 2. For the grades related to <u>final exam</u>, students should contact the instructor <u>within</u> <u>24 hours</u> (one day) once the grades are posted.
- 3. All other grades students should contact the instructor **within two days** once the grades are posted.

Instructor's Practices and Procedures

Academic Integrity

You are expected to be familiar with the College'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.

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

The HCCS attendance policy states: "Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Although it is the responsibility of the student to drop a course for non-attendance, the instructor has full authority to drop a student for excessive absences. A student may be dropped from a

course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time)."

Note that for this course, **FIVE classes missed would exceed the 12.5% limit**. If circumstances significantly prevent you from attending classes, please inform me. I realize that sometimes outside circumstances can interfere with school, and I will try to be as accommodating as possible, but please be aware of the attendance policy.

For Fall 2020, the last date to withdraw from the course is **Friday October 30, 2020**. I urge any student who is contemplating withdrawing from the class to see me first! You may be doing better than you think. Either way, I want to be accessible and supportive. I do not believe in "weed out" classes, and I consider you to be much more than just a name or number! Note my email address above; if you need assistance, I'm here to help.

Students desiring to withdraw from a class must do so by the above withdrawal date by filling out a withdrawal form at the registrar's office. After this date, instructors can no longer enter a grade of "W" for the course for any reason.

Student Conduct

Students are expected to maintain cordial and professional conduct as would be expected of an academic environment and as laid out in the Student Handbook. Please be considerate in your correspondence with the instructor and/or any classmates as well as in any in-person interaction.

Academic integrity is also considered to be a part of appropriate conduct.

Every student as well as the professor has the right to work in a healthy learning environment based on mutual respect and adherence to rules. Conduct unbecoming of such an environment must be avoided.

Instructor's Course-Specific Information (As Needed)

Most work will be through Canvas. In Canvas, the course is divided into Modules, with one module for each chapter.

In the Welcome module, some general information about the course is given. The remaining Modules are chapter-wise. Each module contains the following:

Lecture notes:

Lecture Videos: Pre-Recorded Lectures for the chapter.

Homework Link: Link to the HW set for this chapter.

Quizzes Link:

Solutions:

When you open canvas, on the right-hand side it will show you what assignment is due in the coming days. See this so you don't miss any deadline.

Electronic Devices

If a need arises to make or receive an urgent call, students may excuse themselves from class to tend to it. However, cell phone use is otherwise not permitted in class.

Physics Program Information

Please visit the Physics Program page on the HCCS website for information regarding degree offerings, requirements, employment prospects and more. https://www.hccs.edu/programs/areas-of-study/science-technology-engineering-math/physics/

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. 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

Chair: Dr. Kumela Tafa, kumela.tafa@hccs.edu, 713-718-5569

Associate Chair: Dr. Cyril Anoka, Cyril.anoka@hccs.edu, 713-718-5638

Department Administrative Assistant:

Ms. Nettie Muhammad, nettie.muhammad@hccs.edu, 713-718-6050.