MERCER COUNTY COMMUNITY COLLEGE

Math Science and Health Professions

University Physics III

PHY 225 Spring 2017

Course Description

This course is the third semester of a three-semester, calculus-based physics sequence, and is a study of heat and thermodynamics, optics, atomic and nuclear theory, relativity, and particle theories. The laws of physics are investigated and applied to problem solving. Lec 3hrs/lab 3hrs.

Prerequisites/Co-requisites

Prerequisite: PHY 215

Student Learning Outcomes

1. Students will be able to gain knowledge of a broad introduction to physics at the beginning college level and develop physical intuition and problem-solving skills.
2. Students will learn to handle a variety of instruments and development critical thinking skills through hands-on laboratory experience.

Course Materials

A text book is required for the lecture, laboratory, as well as the homework.

Required textbook: Halliday & Resnick: Fundamentals of Physics Extended, 10th Edition

Publisher: John Wiley & Sons

Laboratory Handouts will be provided for experiments.

Course website includes course information. http://www.mccc.edu/~huangj/

Mercer email will be used to enhance the communication for the course. Please check regularly.

Computer lab MS 211 is available for students to use for course-related work.

A note book and three pens are needed. Scientific calculator is required for lecture, laboratory and tests. Calculators CAN NOT be shared during any test.

Using of cell phone during class or test/quiz in any manner is considered distractive to class and may results in lower grade.

Evaluation & Requirements of Students

LectureTests	60%
Lecture classroom participation	-5% +5%
Lab report	20%
Lab tests	10%
Laboratory participation	-5% +5%

There is NO make-up test; the lowest grade is dropped.

Class Attendance Policy

Students are required to attend all classes and should sign attendance sheet each day. In case of transportation, medical or other emergencies, relevant hardcopy documentation is required to be submitted to instructor. Such documents include car repair invoice, doctor's note, court note, etc. Every two undocumented absent days will reduce final grade by 1%; two lateness counts as one absence. Lateness for lab counts too.

Student Dress Policy

Students are required to dress appropriately. Please keep in mind that the class will share limited space and you'll need to sit, stand, stretch, bend over, and crawl sometimes. Should your shirt/pants have shrunk, we suggest that you put on a large shirt over them.

Supporting Services

Our faculty provides office hours to help students with questions. The best way to take advantage of the time is to go prepared with specific questions to ask.

Name	Email	Office Hours
Jing Huang	huangj@mccc.edu	

- Our library holds the textbook as reference.
- Our tutoring center behind the bookstore provides tutoring. Please check out the tutoring schedule. It is helpful to know one or two tutors before you need immediate help.

Campus Security

Emergency number for campus security is (609) 570-2222. The non-emergency number for campus security is (609) 570-3503. You may call security to have a classroom unlocked prior to a class. Please store these numbers in your cell phone.

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Unit	Date	Lecture	Lab	Homework
I Heat	1/18	Temperature, Thermal Expansion	Lab Introduction & Thermal Expansion	Chap. 18 4, 9, 15, 29, 35, 45, 57, 79, 86, 95
	1/24	Heat, First Law of Thermodynamics	Thermal Expansion	
	1/26	Avogadro's Number Ideal Gases	Gas States	Chap. 19 5, 9, 16, 27, 35, 38, 47, 59, 69, 83
	2/1	Distribution of Molecular Speeds	Calorimeter Specific Heat	
	2/3	Test 1	Survey	Chap. 20 5, 16, 20, 23, 31, 34, 37, 45, 66, 72
	2/7,9	Entropy	Heat of Fusion	
	2/14, 16	Second Law of Thermodynamics		
II Optics	2/21	Reflection, Refraction & Total internal Reflection	Reflection, Refraction & Total internal Reflection	Chap. 33 1, 34, 45, 47, 57, 58, 59
	2/23	Mirrors & Lenses	Mirrors & Lenses	Chap. 34 4, 6, 20, 43, 46, 68, 91, 94, 112
	2/28	Interference, Diffraction	Interference	Chap. 35 4, 13, 23, 30, 34, 39, 55, 75, 89, 94
	3/6	Double Slit Thin Film	Double Slit	
	3/8	Diffraction Single Slit	Diffraction Single Slit Grating	Chap. 36 2, 4, 8, 18, 20, 28
	3/13	Grating	Review	
	3/15	Unit Test 2	Solar Car	

III Relativity Duality	3/20	The postulates, Relativity of Time	Research: Relativity	Chap. 37 4, 12, 21, 23, 31, 40, 60, 61
	3/22	Relativity of Length	Presentation: Relativity	
	3/27	Photons	Light sensor	Chap. 38 2, 4, 12, 20, 26, 47, 50, 63 or 64, 79, 82
	3/29	Uncertainty Principle	To Be Decided	
	4/3	Matter waves of an electron	Spectrometer	Chap. 39 2, 6, 13, 17, 31, 32, 33, 38, 62, 63
	4/5	Hydrogen Spectrum	Hydrogen Spectrum	
	4/10	Bohr Model Schrodinger's Equation	Review	
	4/12	Unit Test 3	Radiation	
IV Atomic Molecular Nuclear Physics	4/17	Atomic Quantum Numbers, Magnetic Resonance	Atomic Spectrum	Chap. 40 2, 6, 28, 30, 52, 55, 65, 71
	4/19	Pauli Exclusion Principle	Lasers	
	4/20	Nucleus, Radioactive Decay	Nuclear Radiation	Chap. 42 9, 16, 26, 33, 38, 42, 50, 54, 67, 68
	4/24	Alpha Decay, Beta Decay	Alpha & Beta Decays	
	4/26	Fission	Princeton Plasma Physics Lab	Chap. 43 6, 7, 30, 36, 37, 51
	5/1	Fusion	Princeton Plasma Physics Lab	
	5/3	Quarks, Leptons, and the Big Bang	Review	Chap. 44 3, 4, 5, 11, 33
	5/8	Unit Test 4	Awards	
	5/10	Final Exam		

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Class Survey of Student Opinion after first Section	Class Survey of Student Opinion after second Section
1. What do you like about this class?	1. What do you like about this class?
2. What do you dislike about this class?	2. What do you dislike about this class?
3. What do you think can be done differently to make this class better?	What do you think can be done differently to make this class better?

Survey Name _____ Date _____

1. What's your major? What is your accumulated GPA and total number of credits?
2. What's your experience about your last physics class?
3. One the scale of 1 to 10, how much effort do you put in studying physics? Please explain.
4. Is there anything else you would like the instructor to know about you?
5. Think of a fact and a fiction about yourself to tell the class. For example: I have a dog; I have a cat.