

Fayetteville State University

College of Arts and Sciences

Department of Natural Sciences

**PHYS 111-01 and General Physics I
Fall, 2009**

I. Locator Information:

Instructor: Jianshi Wu

Course # and Name: PHYS 111-01, General Physics I

Office Location: LS 233

Semester Credit Hours: 4

Office hours: MW: 2 - 5 p.m.; F: 11a.m.-1p.m.

(Available at other times by appointments.)

Day and Time Class Meets: T R:8 - 9:15 a.m.; Lab W: 8-9:50 a.m.

Office Phone: 672-1926

Total Contact Hours for Class: 5

Email address: jwu@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at
<http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. COURSE DESCRIPTION

An introductory study of the phenomena and concepts of classical physics, emphasizing mechanics, wave motion, fluids, temperature, and heat, with laboratory exercises providing practical knowledge in handling laboratory apparatus, data collection, and data interpretation related to topics discussed in the lectures.

Prerequisites: Math 124 or 131.

III. DISABLED STUDENT SERVICES

In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. TEXTBOOK

Cutnell, John D., and Johnson, Kenneth W., Physics, 8th ed., New York : John Wiley & Sons Inc, 2009.

David H. Loyd, Physics Laboratory Manual, 3rd ed., New York: Saunders College Publishing, 2008.

V. Student Learning Outcomes:

Upon completion of this course all students will be able to:

A. Identify the fundamental laws and principles of classical mechanics, wave motion, and heat, including the following :

1. Newton's laws of motion;
2. Newton's law of gravity;
3. Conservation laws of Newtonian mechanics;
4. Characteristics of vibrations and wave motion;
5. The laws of thermodynamics.

(Assessment: tests and quizzes)

B. Recall the important terms and basic formulas, in conjunction with the units of measurements in physics, including :

velocity (speed)	acceleration	mass	force
weight	impulse	momentum	work
energy (kinetic energy and potential energy)			power
angular velocity	angular acceleration	angular momentum	
moment of inertia	pressure	stress	strain
amplitude	period	frequency	wavelength

wave speed wave intensity temperature heat
(Assessment: homework, tests and quizzes)

C. Interpret word problems in terms of the symbols used in the mathematical expressions of the laws of physics.
(Assessment: homework and tests)

D. Choose an appropriate procedure in the solution of Problems that illustrate the principles and laws of physics.
(Assessment: homework, and tests)

E. Apply those principles and laws to a systematic and coherent explanation of physical phenomena, and relate the major concepts of physics to biology, chemistry, and the earth/space sciences.
(Assessment: Lab reports)

F. Apply practical knowledge in handling laboratory apparatus, data collection, and data interpretation, and use computer software in data processing.
(Assessment: Lab reports)

This course addresses the following competencies specified by the North Carolina Department of Public Instruction.

- 1.0 Explain the major concepts and principles of physics. Teachers should demonstrate competence and understanding in their ability to investigate:
 - 1.1 the properties of matter, including but not limited to, spatial characteristics, inertia, gravity, density, magnetic, optical, electrical, and radioactivity.
 - 1.2 kinematic relationships, dynamics, momentum, and Newton's laws.
 - 1.3 Work, energy, and power principles using applications.
 - 1.4 Conservation principles, charge, mass, energy, and momentum through appropriate laboratory activities.
 - 1.5 Wave mechanics and sound phenomena through laboratory exercises and problem-solving.
 - 1.6 Principles of thermodynamics, including the heat equivalent of work.
- 2.0 Understand the interrelationships among the sciences, and relate the major concepts of biology, the earth/space sciences, and chemistry to physics.
- 3.0 Apply appropriate mathematics to investigations in physics and the analysis of data.

- 4.0 Relate the concepts and principles of physics to contemporary, historical, environmental, technological, and societal issues.
- 5.0 Locate resources; design and conduct inquiry-based, open-ended investigations in physics; interpret findings, communicate results, and make judgments based on evidence.

VI. Course Requirements and Evaluation Criteria:

A. Grade Scale:

The letter grade awarded will be determined by the following scale :

90 -- 100	: A	80 -- 89	: B
70 -- 79	: C	60 -- 69	: D
		59 & below	: F

B. Attendance Policy:

In keeping with the attendance policy mandated by the University: students who have missed 10% contact hours will be assigned an interim grade "EA" for warning purpose, a student will be assigned a grade of "EA", if the student has been absent in excess of 8 contact hours.

C. Graded Assignments:

(1) 12 best scores for homework assignments are averaged for the overall evaluation. Bonus points are awarded to the other assignments turned in on time. More assignments turned in on time, more bonus points earned.

(* Bonus points will not be awarded to any assignment without a passing grade.

(2) 4 best scores for lab reports are averaged for the overall evaluation. Bonus points are awarded to the other lab report if it is turned in on time.

(3) Quizzes will be administered at the beginning of the class for bonus points.

(4) 5 to 10 bonus points may be awarded towards the regular examinations for special assignments to be announced in class.

D. Evaluation of Lab Reports :

Objectives and theory : 10% ;
Lab work and data taken : 60% ;
Data Processing : 20% ;
Presentation of results and comments : 10% .

E. Grade Distribution:

The student's grade for the course will be computed in accordance with the following distribution:

Three Regular Tests	: 40 %
Final Exam (comprehensive)	: 30 %
Laboratory Work	: 20 %
Homework	: 10 %

F. Policy on missed and late assignments:

Assignments turned in late without an acceptable excuse will be graded with **10% deduction for each week after the due date. The deadline for a late assignment is three weeks from the due date.**

G. Other Rules and Requirements:

Attendance:

The attendance policy of the University will be strictly adhered to. The student is required to attend lecture, recitation, and laboratory sessions, except in cases of illness or unforeseen emergency. In the latter cases, it is the responsibility of the student to contact the instructor about the steps that must be taken towards making up any missed work. It is recommended that the student contact the instructor within twenty-four hours of having missed a lecture /recitation / laboratory session or an exam.

Students are expected to be in class on time. Therefore, attendance will be taken promptly at the very beginning of each class period. Any student coming 15 minutes after the beginning of the class hour will have been marked absent.

Student must take all tests and the final exam. A make-up test is possible for documentary absence from a test with an acceptable excuse, but this courtesy will not be extended to the student who is simply not prepared on the day of a test. Undocumented absence from a major commitment such as a test or any assignment deadline commitment automatically earn the student a grade of "FAILURE" for that commitment. If the student anticipates a conflict of the scheduling of any course requirement with some personal event notice should be given to the instructor before the conflict in order to have consideration given to the problem.

Assignments:

Assignments for this course consist of word and/or numerical problems chosen from the full set at the end of each chapter. The assignments for each chapter should be turned in at the beginning of the class hour on the due date. **The deadline is three weeks from the due date.** Absence from class is not an excuse for missing homework assignments. If abnormal circumstances seem likely to prevent the student from meeting

a deadline, a one-day notice in advance of the deadline should be extended to the instructor for special consideration.

The student is encouraged to devote as much time as possible to the thorough understanding of the concepts and techniques involved in the solution of the problems, since these reflect heavily in the questions of the exams. The list of homework problems is given in the assignment schedule.

Laboratory sessions are scheduled to allow students to familiarize with the instrumentation of classical physics. The activities and results of each experiment are to be described and discussed in a written report. Laboratory reports are to be turned in at the beginning of the class hour on the due date (i.e. two weeks from the day when the experiment is carried out).

Examinations:

Each exam is graded on a 60 / 40 basis; 60 points are allotted to objective questions and 40 points are earned by solving problems. The objective questions emphasize concepts and one-step problems. Partial credit can be earned for any steps toward the solution of the multi-step problems. It is recommended that any examination, missed because of illness or an unforeseen emergency, be made up prior to the next scheduled test.

Blackboard and Email:

Blackboard and email are the official channels of Communication for this course. Students are required to check email everyday, and to visit blackboard/course PHYS111 for announcements and special assignments.

Other Requirements:

All students are required to have a scientific calculator, and it is expected that the student will **ALWAYS BRING A SCIENTIFIC CALCULATOR AND THE TEXT BOOK TO EACH CLASS.**

NO SMOKING, EATING AND DRINKING WILL BE ALLOWED IN CLASS. THE STATE PROHIBITS THE USE OF DRUGS AND ALCOHOL ON STATE PROPERTY.

Students are encouraged to use the software to simplify the calculations for their lab reports. If the calculation is done by the computer a computer printout is required in the lab report.

Consequences for Failing to Meet Behavioral Expectations:

The first time a student violates one of these rules, the instructor will warn him or her privately, either after class or before the next class. (The instructor reserves the right to warn students publicly if needed.)

VII. ACADEMIC RESOURCES

Students are encouraged to seek academic support at Blackboard (on-line), University College Learning Center and the FSU RISE PROGRAM.

VIII. COURSE OUTLINE AND ASSIGNMENT SCHEDULE

This course consists of four phases: regular tests are administered at the end of first three phases. A comprehensive final examination is given at the completion of the course. An assignment schedule is given with a due date for each assignment.

DATE	SESSION	TOPIC
8 / 20	1	Class orientation Ch.1, Introduction
8 / 25	2	Ch.1, Vectors
8 / 26	3	Lab 1 (Data Processing) No Lab Report, (LS 219)
8 / 27	4	Ch.2, Kinematics in One Dimension
9 / 01	5	Ch.2, Uniform Acceleration
9 / 02	6	Lab 2 (#3: Force Table) (LS 219)
9 / 03	7	Ch.3, Motion in Two Dimensions
9 / 07	-----	Labor Day Holiday
9 / 08	8	Ch.3, Relative Motion
9 / 09	9	Lab 3 (#2:Density Measurements) (LS 219)
9 / 10	10	Ch.4, Newton's Laws
9 / 15	11	Ch.4, Forces
9 / 16	12	Review (Ch. 1-4) (LS 219) Pre-test 1.
	*	Due date for the report of Lab 2 *

9 / 17	13	Ch. 5 Uniform Circular Motion
9 / 22	14	Exam 1 (Ch. 1-4)
9 / 23	15	Ch.5, Recitations Ch.6, Work and Energy (LS 219)
	*	Due date for the report of Lab 3 *
9 / 24	16	Ch.6, Conservation of Energy
9 / 29	17	Ch.7, Impulse and Momentum
9 / 30	18	Lab 4.(#4:Uniform Acceleration) (LS 219)
10 / 01	19	Ch.7, Collisions
10 / 06	20	Review (Ch. 5-7) Pre-test 2
10 / 07	21	Ch. 8. Rotational Motion (LS 219)
10 / 08	22	Ch. 8. Rolling Ch. 9. Torque and Equilibrium
10 / 13	23	Exam II (Ch. 5-7)
10 / 14	24	Ch. 9. Angular Momentum (LS 219)
	•	Due date for the report of Lab 4 *
10 / 15 - 17	-----	Fall Break
10 / 20	25	Ch.10, Simple Harmonic Motion
10 / 21	26	Lab 5 (#7: Friction) (LS 219)
10 / 22	27	Ch.10, Elasticity
10 / 27	28	Ch.11, Fluids
10 / 28	29	Ch.11, Bernoulli's Equation (LS 219)
10 / 29	30	Ch.12, Temperature and Heat
10 / 30		* Last Day to Withdraw from Class *
11 / 03	31	Ch.12, Latent Heat
11 / 04	32	Lab 6 (Energy Conservation) (LS 219)

* Due date for the report of Lab 5 *

11 / 05	33	Review (Ch. 8-12) Pre-test 3
11 / 10	34	Exam 3 (Ch. 8-12)
11 / 11	---	Holiday -----
11 / 12	35	Ch.13, The Transfer of Heat
11 / 17	36	Ch.14, Ideal Gas
11 / 18	37	Ch.15, The First Law of Thermodynamics (LS 219)
11 / 19	38	Ch.15, The Second Law of of Thermodynamics
11 / 24	39	Ch.16, Waves
11 / 25	40	Ch.16, Sound (LS 219)
11 / 26 - 28	----	Thanksgiving Holidays
12 / 01	41	Ch. 17, Interference
12 / 02	42	Ch. 17 Doppler Effect Review (Ch. 13 - 17) (LS 219)
12 / 03	43	Comprehensive Review
12 / 04		Deadline for all assignments and lab reports
		Final Exam: Tuesday, 12/08/09, 8:00 - 9:50 A.M., LSA 121

Assignment Schedule:

Chapter	Homework	Due Date
1	2, 7, 11, 16, 21, 33, 42	9 / 01
2	3, 7, 12, 19, 40, 59, 60	9 / 08
3	1, 6, 12, 31, 50, 53	9 / 15
4	1, 10, 18, 37, 64, 72	9 / 22
5	3, 12, 20, 29, 41	9 / 30
6	2, 15, 27, 32, 46, 67	10 / 01
7	1, 7, 16, 25, 31, 43	10 / 08
8	4, 10, 18, 28, 40, 46	10 / 20
9	2, 8, 12, 30, 50, 52	10 / 22

10	2, 17, 28, 40, 46, 51	10 / 29
11	7, 11, 22, 32, 49, 55, 60	11 / 04
12	3, 10, 26, 45, 53, 58	11 / 10
13	3, 10, 20, 29	11 / 19
14	6, 9, 28, 30	11 / 24
15	2, 10, 24, 30, 40, 47, 68	12 / 01
16	3, 13, 24, 29, 48, 60, 71	12 / 03
17	3, 12, 20, 29	12 / 04

IX. TEACHING STRATEGIES

Physics is an experimental science which describes the real world. All physical concepts and theories originate from practice and observations. As a general approach in this course, we will start each topic from the experiences that students can relate to, and then move on to the generalizations and quantifications. This is the way not only making the materials more interesting and easier to understand, but also closer to the way physics is actually practiced. Mathematics is essential to the formulation and derivation of laws of physics, however, we will be more focused on physical concepts, and use mathematics as a tool to unravel the mystery of physical principles. In order to seek a systematic and coherent explanation of physical phenomena through this course, we will include as many applications a possible in problem solving.

X. BIBLIOGRAPHY

Wilson, Jerry D., Anthony J. Buffa and Bo Lou, College Physics, 7th ed., New Jersey : Prentice Hall, 2009.

Douglas C. Giancoli, Physics Principles With Applications, 6th ed., New Jersey: Prentice Hall, 2005.