

Instructor's Office A126-A. Hours MW 2:45-3:45p; T 4:15-5:15p; Th 11:45a-12:15p, 1:15-2:45p, 4:15-5:15p
505-925-8727 wcmurray@unm.edu

Prerequisite: Completion of Phyc161 with course grade of C or higher.

Useful Materials:

Text: Fundamentals of Physics 10th ed. Extended, by Halliday, Resnick, & Walker. Nearly all homework assignments, and some test problems, will come from the text.

Calculator: A graphing scientific calculator will occasionally be used in basic ways—arithmetic, scientific notation, trig/inv trig functions, exponents, logs, and graphing. Calculators may be used on tests; however, all test problems requiring calculations must show those calculations, clearly and in detail, on paper—merely writing down results from a calculator (other than arithmetic), without giving the full reasoning &/or mathematics behind it, will result in reduced credit.

Student Learning Objectives: By the end of the course, the student should be able to explain the physical meaning of, and solve problems involving, at least the following: Electromagnetic waves, ray Optics, & wave optics; Special Relativity, incl. length contraction and time dilation, mass-energy and momentum in relativity; fundamental Quantum physics, espec. photons and matter waves, the difficulty of conceptualizing what an electron “is” (particle or wave), Schrodinger’s equation and it’s solution for the hydrogen atom, and why quantum physics is intrinsically probabilistic; the quantum structure of atoms in general and how this leads to the quantized energy-level analysis of crystalline solids and semiconductors; how semiconductor devices (espec. diodes and transistors work in circuits; basic physics of the nucleus, including nuclear decay modes, nuclear reactions (incl fission and fusion), the production of nuclear energy; elementary particles’ properties and categorizations; and finally, concepts and basic calculations in cosmological physics.

Academic Dishonesty as defined in the UNM-VC catalog includes copying work from other students. Any student found doing this on tests is subject to disciplinary action, ranging from “a reduced or failing grade for the work in question and/or the course” to “dismissal from the University”.

Disruptive Behavior is any behavior which interferes with other student’s learning or the instructor’s ability to guide that learning. Examples include loud talking/ laughing/chatting with your buddy which require repeated warnings from the instructor, or derisive/ridiculing comments toward well-meaning students or the instructor—this is the quickest way to get expelled from the class. Keep your motives constructive, and it’ll be a good educational experience.

* Please Keep *cell phones OFF* during class. **No use of cell phones during tests.***

Sexual Misconduct : Any report made to a faculty member, TA, or GA regarding sexual misconduct or gender discrimination must be reported to the Office of Equal Opportunity and the Title IX Coordinator. For more information on campus policy regarding sexual misconduct, see <https://policy.unm.edu/university-policies/2000/2740.html>

Children in Class: Children are not permitted in class. This is regrettable, but it is due to liability concerns.

Disabilities: Should you have a documented disability requiring special accommodations, please provide the instructor with appropriate documentation from Equal Access Services, so those accommodations can be made available.

A *formula sheet* will be provided for each test. Only minor notes, such as a word describing a formula or a quantity, may be added to the sheet. No example problems, whether partially or fully worked out, are allowed on the formula sheet. Any student found with such will have the formula sheet confiscated, and will be subject to disciplinary action.

Attendance is expected. After Four no-prior-notice, unarranged, or unexcused absence, the Instructor may drop you from the course without further warning.

Homework Format: Homework problems should be clearly separated, either by whitespace (that means more space between main problems than within the problem), or by a separation line between main probs (not between subprobs a, b, c...). Turn homework in by *day*—not by section. A list of each day’s hmwk is provided on the Calendar which accompanies this document.

Also, please either put the **main** prob #--5, 11, 21, ...etc (**not** a,b,c...)—to the left of all other work, **or** make it extra BIG. This is to also help make the separation between main problems really obvious, so the instructor can find and check off the main problems fast. Finally, nearly all homework problems pertain to a physical situation. For these type problems, a simple **sketch** is required.

Physics homework should be turned in **by chapter**, stapled. Do not split chapters, even though the schedule might split problems from the same chapter across different days. A chapter will be graded only once-by whatever comes in first. No credit will be given for later, partial turn-ins on the same chapter.

Makeup Work: Tests: There are no makeup tests, except in genuine emergencies—in such cases, expect a maximum score of 80%. (If needed for good reason, the Instructor will try and arrange an *early* test for the student.) The lowest of the tests or homework is dropped, but note that if any test is not taken, or the end-of-course homework total is less than 50% the student will not receive a grade higher than A-, regardless of total after the low-score drop.

Homework : 1 class day late: -50%. 2 class days late: Zero credit.

All Homework assignments are due at first of class, on the relevant test day.

Final Exam Minimum: **Less than 65% on the final exam will result in a course grade no higher than “D”**, regardless of semester point total.

Grade weighting:

	Max possible points
Homework	100
4 tests	400
Drop lowest one of tests or homework:	-100
Final exam (not dropped, comprehensive)	<u>150</u> min to pass course with greater than D—97.5/150 (65%)
	550 Max poss course total

$532 \leq x < 550$	A+ (unless a test is missed, or homework total is less than 50%)
$512 \leq x < 532$	A (unless a test is missed, or homework total is less than 50%)
$495 \leq x < 512$	A-
$477 \leq x < 495$	B+
$457 \leq x < 477$	B
$440 \leq x < 457$	B-
$422 \leq x < 440$	C+
$402 \leq x < 422$	C
$385 \leq x < 402$	C- *note that a C- may not satisfy the prerequisite for certain courses or programs
$330 \leq x < 385$	D
$0 \leq x < 330$	F

ALL HWK DUE BEFORE TEST

M

PHYS 262 (PHYS III)

1:30-2:45 P

SPRING 2019

CLIFTON MUSEUM

W

14 JAN CH 33 - electromagnetic waves
HWK: PROB # 1, 6, 9, 21, 47, 58

16 JAN CH 34 IMAGES (RAY OPTICS)
QUESTION # 1. PROB # 2, 7, 41, 126, 128

21 JAN
MARTIN LUTHER KING DAY

23 JAN CH 35 INTERFERENCE (WAVE OPTICS)
QUES # 1, 2, 6, 3
PROB # 14, 19, 91

28 JAN CH 36 DIFFRACTION
PROB # 1, 4, 8, 20, 23, 45, 64

30 JAN
REVIEW

4 FEB HWK CH 33, 34, 35, 36 DUE AT
TEST # 1 OPTICS

6 FEB CH 37 RELATIVITY
PROB # 1, 3, 4, 9, 10

11 FEB CH 37 RELATIVITY
PROB 16a, 16b, 17, 27, 29

13 FEB CH 37 RELATIVITY
PROB 35, 37, 38, 41, 42, 51, 56

18 FEB FINISH CH 37 RELATIVITY
PROB 57, 80, 99, 100, 101(a)

20 FEB
RVW

25 FEB HWK CH 37 DUE
TEST # 2 RELATIVITY

27 FEB CH 38 INTRO QUANTUM PHYSICS -
PHOTONS. MATTER WAVES.
PROB # 3, 5, 15, 27, 42, 43, 46, 47

4 MAR 38 CONTIN: # 61, 62, 67.

6 MAR CH 39 CONTIN # 32, 35, 39, 46, 61, 63

CH 39 MORE QUANTUM PROB 3, 13, 17

START CH 40 ATOMIC PHYSICS

11 MAR
SPRING

13 MAR
BREAK

18 MAR CH 40 ATOMIC PHYSICS CONTIN
PROB # 2, 5, 30, 33, 53, 74

20 MAR CH 41 SEMICONDUCTORS
PROB # 3, 13, 28, 43, 44

25 MAR
RVW

27 MAR HWK DUE CH 38, 39, 40, 41
TEST # 3 QUANTUM PHYSICS

1 APR CH 42 NUCLEAR PHYSICS
1, 7(a,b,c), 9, 13.

3 APR 42 NUCLEAR PHYSICS
25, 26, 32, 45

8 APR 43 NUCLEAR ENERGY
QUES # 1, PROB # 5, 30, 37, 51

10 APR 44 ELEMENTARY PARTICLES
QUES # 1, 3, PROB # 1, 5

15 APR 44 ELEMENTARY PCE
QUES # 9, PROB # 14, 17, 25, 27

17 APR 44 COSMOLOGY
PROB # 31, 33, 35, 38

22 APR
RVW

24 APR HWK DUE CH 42, 43, 44
TEST # 4 NUCLEAR? ELEM. PCE
PHYSICS

29 APR
RVW

1 MAY
RVW

6 MAY

8 MAY
FINAL EXAM 1:00-3:00 P