Physics II (1240) **Syllabus** Spring 2020 Clifton Murray, UNM-Valencia

Class meets T Th 3-4:15p

Prerequisites: Physics I (1230) with grade of C or better, or instructor permission.

Recommended (but not required) concurrent course: Physics II Lab (152L) Tuesdays, Noon-2:45p

Instructor's office & hours—A126A, Hours MW 3:20-4:20p; T 4:15-5:15p; Th 11:45a-12:15p, 1:30 -2:45p, 4:15-5:15p.
wcmurray@unm.edu 505-925-8727

Text: College Physics 7th ed., Wilson, Buffa, & Lou
A scientific calculator (having trig and powers-of-ten functions) is required.

Student Learning Goals & Objectives: To be able to explain or/and solve problems involving: electric fields, forces, and potential (voltage); d.c. and a.c. circuits, and therefore voltage, current, resistance, capacitance, inductance, and impedance; magnetism, including electromagnets as well as permanent magnets and transformers.; electromagnetic induction; electromagnetic waves; concepts of quantum, atomic, and nuclear physics, recent hypotheses and observations of elementary particles and the Universe; selected results from Einstein's relativity theory.

Policies and Notices:
**After four accumulated absences, the student may be dropped by the instructor without further notice.*

*"*Makeup" tests will be given only at the instructor's discretion*—in other words, the instructor is free to **not** give a makeup. If a makeup is given, expect a *maximum score of 85%,* because of (i) the unfair advantage of a makeup over students who took the test on time, and (ii) the additional time and effort required of the instructor in preparing, scheduling, administering, and grading the makeup.

**Late homework.* Credit will be reduced by 50% if one day late; minus 100% if two or more days late. Homework due dates are indicated on the schedule accompanying this syllabus.

**Persistent disruptive behavior,* such as loud talking, ridiculing or intimidating the instructor or other students, or other forms of distraction, will result in the offender being dismissed and dropped from the class.

**Cell phones* Off, please, during class. No text messaging in class. No calls in or out of room during tests. If you must exit the room, either leave your phone with the instructor or explain the situation to him.

**Reporting Sexual Misconduct:* Any report of sexual misconduct or gender discrimination made to a UNM faculty member, TA, or GA must be reported to the Office of Equal Opportunity and the Title IX Coordinator (acatena@unm.edu, 505-277-5251).. For more information on UNM policy re sexual misconduct see https://policy.unm.edu/university-policies/2000/2740.html

*If you have a *documented physical disability* which could interfere with learning in a standard classroom environment, please inform the instructor so we can make appropriate accommodations.

**Children* are not permitted in class, regrettably; this is due to liability concerns.

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. That is, if sec 3.1 and 3.2 are presented on the same day, 3.1 and 3.2 should be grouped together—stapled—not separate.

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 help make the separation between main problems really obvious, so the instructor can find and check the main problems fast. Finally, nearly all homework problems in physics pertain to a physical situation. For such problems, a simple **sketch** is required (it's not pure math; it's Physics.)

Homework is due on test days, at the 1st of class. Turn in homework stapled by chapter, do not split chapters. Only one grading will be done on each homework—on whatever is turned in 1st. Once part of a chapter is turned in, no further parts will be scored. Again—1.0 class day late reduces the possible max score to 50%, two or more days late receives zero credit.

A *Formula/Equation sheet* will be provided before each test. Only minor notations on the sheet are allowed. No example problems are permitted. The Instructor may inspect any formula sheet any time during tests; if example problems or excessive notes are found, the sheet will be confiscated, and the test grade lowered at the Instructor's discretion.

****Final Exam Minimum Grade*** is **65%** in order to receive above a "D", regardless of other test or homework scores.

Grading:	Maximum points
Homework	100
4 tests	400
Drop lowest one of tests or homework:	-100
Final exam (not dropped)	150 **(min 97.5 (65%) to receive higher than a "D".)**
	550 Max poss course total

("x" = student's total accumulated points)

$536 \leq x \leq 550$	A+	(unless a test is missed, or homework score is less than 50%).
$509 \leq x < 536$	A	(unless a test is missed, or homework score is less than 50%)
$495 \leq x < 509$	A-	
$481 \leq x < 495$	B+	
$454 \leq x < 481$	B	
$440 \leq x < 454$	B-	
$426 \leq x < 440$	C+	
$399 \leq x < 426$	C	
$385 \leq x < 399$	C- *Note: a C- may not meet the prereq for some courses or requirements of some programs	
$330 \leq x < 385$	D	
$x < 330$	F	

No "Incomplete" (I) grades will be given.

"HMWK FROM THE EXERCISES" UNLESS OTHERWISE NOTED

SPRING 2020
PHYSICS II/1240 (ALG-TRIG BASED)

TURN HMWK IN BY CHART BEFORE TEST.

T	Th MEETS 3:00-4:15 p
21 JAN FROM CH15: ELECTRIC CHARGE q, FIELD $\vec{E}$ COULOMB'S LAW $\mathcal{F} = k\frac{q_1 q_2}{r^2}$ HMWK #1, 2, 3, 11a, 13, 23, 25, 30, 34a, 43	23 JAN CH16 ELECTRIC POTENTIAL DIFFERENCE $\Delta V = \frac{dU}{q}$ (IF $\vec{E}$ UNIFORM, $\Delta V = Ed$) HMWK [QUES #1], EXER #1, 3, 29, 26...
28 JAN CH16 CONTIN.* CAPACITANCE $C = \frac{Q}{V}$ ... #7a, 8, 10, 35, 37, 49	30 JAN REVIEW CH 15 CH 16
4 FEB TEST #1 CH 15 & CH 16 HMWK DUE BEFORE TEST.	6 FEB CH 17 VOLTAGE V, RESISTANCE R, CURRENT I, $V=IR$, ELECTRIC POWER P. CIRCUITS. #1, 2, 6, 10, 12a, 21, 25, 35, 38, 44, 47
11 FEB (FINI CH17). CH 18 R's-IN-COMBINATION CIRCUITS. HMWK #1, 3, 5, 6, 11...	13 FEB CH 18 CONTIN RC CIRCUITS. "emf" $\mathcal{E}$. ... #30, 31, 34, 48, 50
18 FEB RVW CH 17 CH 18	20 FEB TEST #2 BEFORE TEST: CH 17 CH 18 TURN IN SEPARATELY.
25 FEB CH 19 MAGNETIC FIELD $\vec{B}$. B-FORMULAS. CURLY RIGHT-HAND RULE. #4, 5, 13a, 15, 20, 21, 26, 30, 35, 36	27 FEB FINISH 19. CH 20 MAGNETIC FLUX, Φ INDUCED emf. VOLTAGE TRANSFORMERS. CH20 #1, 2, 9a, 12a, 25, 27, 33, 39, 40, 41
3 MAR FINISH 20. CH 21 a.c. INDUCTANCE, L. REACTANCE, IMPEDANCE. CH 21 #1, 3, 16, 19, 22a, 23, 31, 32...	5 MAR CH 21 CONTIN. POWER IN a.c. ELECTROMAGNETIC WAVES. a.c. OSCILLATOR CIRCUITS. ... #34, 38, 39.
10 MAR RVW CH 19 CH 20 CH 21	12 MAR CH 19, 20, 21 HMWK DUE B4 TEST. TEST #3
17 MAR SPRING	19 MAR BREAK
24 MAR CH 22 LIGHT. RAY OPTICS: LAWS OF REFLECTION & REFRACTION. #1, 2, 10, 11, 13, 16, 21, 31	26 MAR CH 23 LENSES & MIRRORS, $\frac{1}{F} = \frac{1}{o} + \frac{1}{i}$ IMAGES. MAGNIFICATION. #3, 12, 13, 41, 47, 59, 60, 67, 68.
31 MAR FINISH CH 23. CH 24 WAVE OPTICS. DIFFRACTION, INTERFERENCE PATTERNS. HMWK CH 24: #30, 31, 34, 35, 43	2 APR CH 25 RESOLVING POWER OF LENSES, INCL. HUMAN EYE. #1, 2, 50, 51, 52, 53
7 APR RVW CH 22, 23, 24, 25	9 APR TEST #4 CH 22, 23, 24, 25 DUE AT START OF TEST
14 APR BEGIN MODERN PHYSICS: CH 26 RELATIVITY OF SPACE-TIME. #9, 11, 13, 14, 25, 37	16 APR FINISH 26. CH 27 QUANTUM PHYSICS, APPLIED TO THE H-ATOM. CH 27 EXER #11, 13, 14, 15, 37, 42, 44
21 APR CH 28 MORE QUANTUM: IS THE ELECTRON A WAVE OR A PARTICLE? MATTER WAVES. #1, 3, 8, 10, 17, 34	23 APR CH 29 NUCLEAR PHYSICS: EQUATIONS, RADIOACTIVITY. #1, 5, 10, 12, 15, 24, 27, 31, 49, 50, 53
28 APR CH 30 NUCLEAR ENERGY: FISSION & FUSION. #1, 3, 8, 10, 17, 34...	30 APR FINISH CH 30 ELEMENTARY PARTICLES. COSMOLOGY. ... #35, 52.
CINCO DE MAYO* HMWK CH 26, 27, 28, 29, 30 DUE AT START* RVW FOR FINAL	7 MAY RVW FOR FINAL
12 MAY	14 MAY FINAL EXAM 3:00p-5:00p