

Phy.203 §203 2015 Spring (4733) Syllabus (General Physics II)

Instructor: Dr.Curt Foltz ; foltzc@marshall.edu ; Science 159 ; (304) 696-2519

office hours: _T_RF 10:30-1:30pm , __W__ 9:30-11:30 , 4:30-6pm , ___F 2:30-4pm

Phy.203 is : a 3-credit undergrad course, intended for Natural (not Physical) Science majors.

(Chem, Engr, Geol, and Math majors should consider Phy.213+320 instead of Phy.203)

You are expected to be doing Phy.204 Laboratory during the same term as Phy.203.

Class meets in Sci.277, _T_R_ 4-5:15pm, Jan.12 – May.01 ... final Exam Tue.May.05, 4pm

Classes will include discussion questions & exercises – customized for participants ; if you do not routinely participate during class, you cannot complain that it is not useful

Absences: if you miss a Quiz or Exam, schedule with me before the next class to make it up

– otherwise the make-up assessment will probably not be of similar difficulty (oral?).

Prerequisites: Phy.201 and Phy.202

Most students finish 201 with a few bad habits and some big gaps in their understanding.

Do NOT try to hide these by rote copying from someone else's hw, or a textbook example!

Rather, mention them in class (or after class) so we can mend those weak spots right then

Overview: Physics 203 is the second half of a two-semester sequence, introducing concepts & principles which describe and explain the physical world's behavior. Students should expect explanations for change to be based on objects interacting with their environment.

In Physical Theory, Fundamental Fields (Gravity, Electric, Magnetic, Strong, Weak) arise from sources, and cause influence to another object's modifiable properties (*via* Force); each conserved quantity (momentum & Energy, Angular momentum, charge, mass) has a current (*via* geometry) which carries a related field as it travels, doing *Least Action*.

Students will apply theories to simplified scenarios in diverse situations (from biology, chemistry, technology) to describe them with concepts and numbers. Students will use diagrams to represent the invisible, graphs to show relationships, cause-effect wording to describe processes; will translate words & diagrams in-to and out-from symbolic forms (equations & formulae), will manipulate symbols to obtain new statements, and will interpret their calculated results in terms of predicted behavior in the original scenario. Students will become familiar with typical sizes for important quantities, on a few scales.

Equations and formulae are much easier to apply correctly if one knows the vocabulary and geometry; they are much easier to remember if one understands why each term is "as it is". My approach to Physics II is to make this explicit, as early as is feasible.

Before class to start a topic, study the pictures & their captions, to dissect the equations. Ask in class when you don't understand what we're doing and why it works; how to tell?

Do some exercises before trying the problems that are graded! (it saves time, eventually).

Do some practice problems before the Quiz ... do some different ones before the Exam.

Set-up twice as many answers as you solve; read twice as many problems as you set up.

Before a Quiz or Exam, use summaries, notes, vocabulary, and concept maps to make up questions that might be on it; can you answer your study partner's practice questions?

Schedule Plan: the course will split into 4 Units (each Unit contains about 3 Chapters)
(1, big) Electricity ; (2) Magnetism & AC ; (3, big) Optics ; (4, small) Atoms & Nuclei

Letter Plan: 100% > A > 85% > B > 75% > C > 65% > D > 55% > F

I may adjust any letter boundary downward at any time without advance notice.

Point Plan: 4 exams \times 50 points(avg.)/exam = 200 points (55 % of the total course grade)

10 quizzes \times 10 points/quiz = 100 points (27% of the course grade)

16 homeworks \times 4 pts(avg.)/hw = 64 points (18% of the course grade)

The quizzes and home-works count is approximate ... if the count decreases, then the "points each" will remain constant, so total points (and %) in that category will decrease; if the count increases, I'll drop your lowest score (unless that would lower your course%)

Flexibility Disclaimer:

Several situations might occur during the semester that would require us to modify our schedule.

Exam 4's date is not likely to change, but nothing else is set in stone. I will obtain class approval before making any big changes (say, skipping Quiz 5), but don't sweat the small stuff. Ok?

Unit Exam - 75 minute, closed-book, closed-notes solo event, to relate topics of that Unit to each other and to topics in previous Units (all Exams are essentially "comprehensive").

Exam pg 1 has key formulas, not equations. NO 3 \times 5 cards, NO graphing calculators.

Exam 1 (60 pt) Feb.12 ; Ex.2 (40 pt) Mar.10 ; Ex.3 (60 pt) Apr.14 ; Ex.4 (40 pt) May.05

Topic Quiz - 15 minute, closed-book, closed-notes solo event, will *focus on* the recent topic. mult.choice/completion/match/rank for vocabulary, units, facts; 1 or 2 "plug & chug" questions and usually one indirect scenario (4-6 sentence or 2-3 equation).

Homework sets will be posted on each Topic web page, linked to from our phy.203 page.

"Suggested practice" will not be graded, but should guide our classroom activities.

Some graded homework will be on paper; about half will be on-line. Homework should guide your out-of-class study activities before the Quiz. Often 2 hw sets for each topic.

Maybe try: re-draw your Physics concept map each topic (show me?) ... color-code it?

a workbook - not-for-dummies (*Shaum's Outline*, or *Boone's MCAT Physics Guide*).

a different textbook's treatment for some topic (borrow from Drinko or Sci.159):

(for serious self-study: books by *Walker* or *Urone* or *Giordano* or *Knight* or *VanHeuvelen*)

(for easy-read concepts: books by *Hewitt* or *Gonick* or *Dixon*) ... Wikipedia is too deep.

Required textbook: *Sears & Zemansky's College Physics 9th ed.* by Hugh Young ... Volume 2 from Pearson/AddisonWesley (2012) ... (readings will be from Ch.17 - Ch.30, in vol.2)

calculator : non-programmable, with keys (not menu) for EE/EXP, x^2 , \sqrt{x} , $\cos x$, $\sin^{-1} x$, e^x

web browser : for our Phy.203 web site (on CoS server) and to useful links beyond it

(MU-Online, *MasteringPhysics*, *PhysicsForums*, *KahnAcademy*, etc.) see "topic links"

at left edge of the course web site: www.science.marshall.edu/foltzc/p20315sp.htm

attendance: (with pen or pencil, calculator, textbook) at each class meeting, ready to learn

time & effort: in class and out, \approx 8 effective hours/week to read, do assignments, ponder

MU email access: I'll use your Marshall address as an official communication channel.

Recommended: notebook with lined pages ... extremely useful ! (out-of-class and in-class) courage ... to ask for help before you're hopelessly lost (in class) ... or between classes study partner ... it's way more fun than by yourself, & can be more thorough (peer view)

Phy.203 students will:

internalize a base of facts and theories needed to understand Physics II subject matter
be able to point out unifying principles behind this phenomena (many are atomic-scale)
employ mathematical and/or logical rigor to relate scientific concepts and explanations
discuss reasoning on open-ended science-related issues, using science vocabulary correctly
make quantitative predictions of observable quantities, in approximately realistic scenarios
grow in their ability to synthesize more complex results from more basic observations
recognize that Science is built upon the enduring base of fact, but its interpretation is tentative
recognize assumptions in a chain of reasoning, judge their validity, and explore implications
read science texts critically, and interpret them with comprehension, correctly

Statements that are valid for ALL Classes at Marshall:

Academic Dishonesty Policy : honesty is the foundation of science. see pp.66-70 in the catalog : www.marshall.edu/catalog/undergraduate/ug_10-11_published.pdf

Affirmative Action Policy : equal opportunity at Marshall is on pp.63-64 of the catalog

Computing Services' Acceptable Use Policy : don't "lend" your account to others ; don't send spam from it, or solicit from it. see www.marshall.edu/ucs/CS/acptuse.asp

Incomplete Grade Policy: to receive a grade "I", you must have done $\frac{3}{4}$ of the course work, at an acceptable proficiency (passing with a "C" percentage); see pp.86-87 in the catalog.

Students with Disability Policy : the student must initiate procedures ... first, see info at www.marshall.edu/disabled/ ... then, contact the Office of Disabled Student Services (in Prichard Hall 117, phone 696-2271) , which will communicate with me.

Inclement Weather Policy: don't overly-risk your safety trying to get to or from class in a blizzard, flood, or tornado. See pg.64 in the catalog.