Physics 213: University Physics 2 Syllabus 2018 Fall §1 (CRN: 3695)

Meets Mon 10– $11^{\underline{50}}$ +Wed+Fri $11^{\underline{00}}$ – $11^{\underline{50}}$, in Sci.277 (58 in-class "hours" of 3 ks + final)

Instructor : Dr. Curt Foltz ... Science 159 ... foltzc@marshall.edu ... 304 696-2519
Office Hours: MTWRF 12:30 – 14:00 & _W_F 9:30 – 10:30 & most M_W_F afternoons
Do stop by my office, anytime 9-6^{30}. I'll put a note on my office door if I'm elsewhere.

PHY 213: Second half of an introduction to physics for students of physical science or engineering, using calculus and vectors by components; E&M fields, circuits, ray optics, interference, atoms, nuclei. 4 hrs lec. PR: MTH 229 (≥C) + PHY 211 (≥C) + PHY 202 (≥C) ; CR: MTH 230 + PHY 204

When you encounter ideas from these pre-requisite courses that are hazy, try to sharpen them! (textbook? a study partner can be much more help here – see me if they are not).

Regular Attendance & Diligent Preparation is expected - Tenacious Attention anticipated
- •lecture activities will sometimes show a different perspective than our textbook has.
- •Class discussion issues have a much greater impact on your learning if you participate.
- •Necessary recitation / practice / exercise is not as much fun, if done outside of class.
- •Commentary that accompanies an example problem solution is important for understanding.

Required: ***University Physics with Modern Physics***, 14th ed. Young & Freedman (Pearson 2016)
Web browser ; course home page is www.science.marshall.edu/foltzc/p21318f.htm
on-line homework account at MasteringPhysics , for rapid feedback on homework
email access : I will use your marshall email address for official communications
attendance : at each class meeting ready to learn (pen or pencil, calculator, textbook)
time & effort: outside of class, 6-8 effective hours per week to undertake assignments

Recommended : notebook with empty pages (to use in class, and outside of class)
non-programmable calculator : buttons (not menu) for EXP/EE, *sin*, $\sqrt{x}$, x^2, e^x , $^1/_x$
study partner : it's usually more fun and more thorough than studying by yourself
occasional access to a different book, for a new perspective on a sticky topic … in 159/281
(*concepts*: TIPERS, Lightman, Mills, Beiser, Dixon, Barrett ; *practicals*: Schaum's Outline
(*different*: Moore, Reese, Constant, Feynman; *advanced*:, Lorrain, Shadowitz)

Objectives: Phy.213 is part two in a 2-or-3-semester sequence introducing the concepts and principles which describe and explain the physical world's behavior. *Source quantities* contribute to fields & potentials (Gravity, Electric, Magnetic, Strong) in their vicinity, which influence *field quantities* immersed within them (*via* Force, Impulse, Work, Power, Action). Students will simplify scenarios (from astro, bio, chem, geo, space, electronics, technology) to obtain conceptual and quantitative descriptions of the processes which would ensue. Students will represent invisible object quantities on diagrams, and draw how invisible environment properties would influence them. Students will graph relationships, and will use cause-to-effect wording to describe processes. Students will translate between words, diagrams, and symbolic forms (math). Students will manipulate symbolic statements with algebra and calculus to obtain new forms, will interpret calculation results in these scenarios, and will use appropriate numerical quantities (with units!) to compute formerly unknown quantities. Students will practice recognizing typical magnitudes for electric, magnetic, and optic quantities – on subatomic, molecular, human, and planetary scales.

Physics II digs deeply into the *properties* and *behavior* of physical *objects* and *fields*. It bridges from classical view (items compress at contact) to modern view (items are field resonances).
We might spend 30% of our effort on objects, 40% on fields, 30% on math/geometry.
We will use vector components, and take derivatives of functions, with no hesitation.
We will draw pictures of vector fields (in 3+1 dim), and "translate" to symbolic math.
We will integrate functions and vector components, gently with diagrams and commentary.

We will spend about 5 in-class hours on each Topic – 2 or 3 related textbook chapters/Topic.
Textbook "suggested practice" will not be graded, but should guide our classroom activities
(do odd exercises and practice problems before the graded set; do graded set before the Quiz).
Solutions on paper (Quiz, Exam) must show intermediate steps for the answer to count – at all –
Topic Homework will be graded on-line, electronically, but practice writing steps on paper!
We'll have 2 or 3 Topic Quizzes per Unit ~ 2 chapters/topic – nearly one quiz per week.
We'll group Topics into 4 Units (***E***, ***B***, ***S***, ψ), so we'll have 3 Unit Exams and a Final Exam.

50 pts = 10 HomeWork sets × 5 pts/set (typically ½ slope above 3 out of 5)
100 pts = 10 Quizzes × 10 pts/Quiz (typically ⅔ slope above 7 out of 10)
<u>200 pts</u> = 4 Exams × 60+40+60+40 pts/Exam (Sep, Oct, Nov; Tue.Dec.11@10:15)
350 pts => letter grade boundaries plan : A > 85% > B > 75% > C > 65% > D > 55%

Absence Rule: If you miss a quiz or exam, contact me <u>before the next class</u> to arrange a make-up.
Late homework will lose 15% per day late, but never more than 50%.

Quiz keys will be posted on Topic pages, past www.science.marshall.edu/foltzc/p21318f.htm .

Suggestions: look at the chapter pictures & read the captions, before class begins.
ask questions in class when you don't understand <u>what</u> we're doing, and <u>why</u> do it like that
try a few <u>practice problems</u>, before next class – participate in discussion of them
We'll engage in recitation activities whenever we need our memories stirred.

<u>Statements that are valid for ALL Classes at Marshall:</u>

MU's official current policies are viewable on-line at the Academic Affairs website:
http://www.marshall.edu/academic-affairs/policies/
regarding Academic Forgiveness/Dead Week/Sexual Harassment/Academic Rights & Responsibilities

+ Academic Dishonesty Policy: progress in science is founded on honesty and openness
– no lying, no cheating, no stealing (or plagiarism) – dishonesty →0 for that graded item

+ Incomplete Grade Policy: to receive an "I", you must have completed ¾ of the course successfully (*i.e*, passing); course work must be completed within 1 semester (*i.e*, by Dec.`18)

+ Students with Disability Policy: the student initiates procedures to document a disability, then request accommodations, thru the Office of Disability Services (Prichard 117, 696-2271)

+ Inclement Weather Policy: don't over-risk your safety to get to class

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

+ Affirmative Action Policy: Marshall University intends to provide equal opportunity for all.

Some Student Learning Outcomes (order via Attributes of Core II Physical & Natural Science)

Student Learning Outcome	Practiced	Assessed
know basic facts and theories about electricity & magnetism, EM waves, and microscopic matter	classwork & homework	quizzes & exams
identify atomic charge, magnetism, and energies	classwork & homework	quizzes & exams
relate concepts & explanations by math & logic	classwork & homework	quizzes & exams
read & interpret verbal descriptions accurately	classwork & homework	quizzes & exams
recognize and use physics vocabulary correctly	classwork & homework	quizzes & exams
predict Forces, Energies, momenta, and powers for simple model scenarios at many size scales	classwork & homework	quizzes & exams
compare measured observables with predictions	classwork & homework	quizzes & exams
synthesize diode, phasor, Poynting descriptions	classwork & homework	quizzes & exams
discuss deBroglie, Heisenberg, Schrödinger view	classwork & homework	quizzes & exams
judge the validity of model approximations	classwork & homework	quizzes & exams
Show how corrected measurements lead to different numerical predictions for observables	classwork & homework	quizzes & exams