SYLLABUS   PHY 1020   WINTER 2015

Instructor: Dr. Boris E. Nadgorny, Professor   **Office**: 389 Physics
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Office hours: W 3-4 pm or by appointment.

Class details:
01/12/15 - 04/27/15
Location and Time: 2025 Science Hall, M, W, F 10:40 - 11:35 AM
Text: Ostdiek & Bord: "Inquiry into Physics", 7th edition

If you do not need a hard copy, you can get a free ebook with the enrollment to WebAssign.

We will also be using clicker (iClicker-2) for reading quizzes and other assignments.

Assignments and Exams:

Physics can only be learned by engaging with the material. To help you do that, you will be asked to read the text before each lecture and to complete regular assignments. These assignments will be accessible via the WebAssign and the Blackboard systems. You therefore need access to a computer. If you do not own a computer, the undergraduate library has a computer lab for your use or you can use computers available at every public library.

- **Assignments**:
  Web-based: Need to register for WebAssign, Wayne State ID, access to Blackboard:
- **In class: Reading quizzes and other assignments (need to activate iClicker-2)**
- **Exams**: 3 midterm exams (two best count towards grade), one final exam
- **Additional homework**: Not counted for grade, but necessary preparation for exams

Grading schedule:

	Without lab	With lab
WebAssign	20%	16%
Two best midterm exams	50%	44%
Final Exam	30%	30%
Lab	N/A	10%
Clicker questions	15%	15%
TOTAL	115%	115%

OTHER BONUS:

Third hourly exam	4%	4%
Planetarium	1%	1%

Grade determination:

A: 90-100%, A-: 85-89%
B+: 80-84%, B: 75-79%, B-: 70-74%
C+: 65-69%, C: 60-64%, C-:55-59%
D+: 50-54%, D: 40-49%
F: below 40%

100% -> 1000 points
Hints for getting a good grade:

- COME TO CLASS!!
- Do the reading assignments, reading quizzes and homework!
- *You* are responsible for your grade. You will get a good grade if you come to class and do your work diligently. No excuses will be accepted at the end of the semester. Your grade will be determined fairly by your grades on the assignments and exams and *nothing else*.

<u>**WEBASSIGN**</u>:

Weekly to bi-weekly assignments will be posted on WebAssign. (http://webassign.net), which provides online homework submission and grading. If you buy the textbook in the campus store, it should include a WebAssign access card valid for two semesters. Access codes can also be acquired separately from WebAssign; *in this case you will have access to a free interactive ebook*. Once you have the code, you should enroll in WebAssign. This class is called PHY1020, section 001. The class key is wayne 2074 5399. Please also enter your student id when registering to WebAssign.

<u>**CLICKER:**</u>
If you don't have i> Clicker, it can be purchased at the University bookstore. You would need i> Clicker-2 to be able to enter numeric characters. **<u>The last day of clicker registration is January 26.</u>**

<u>**PLANETARIUM SESSION**</u>:
Your instructor, along with the Department of Physics and Astronomy, is offering you a chance to learn more about the night sky and earn a bit of extra credit in the process. During the Fall semester several 55 minute sessions will be held in the Wayne State University planetarium (in 0209 Old Main) for which you can earn 1% extra credit. For information go to "http://physics.wayne.edu/~planetarium/".

<u>**THE RULES**</u>

Please review these rules carefully.

1. **Make-up midterm exams**: There will be <u>no</u> make-up midterm exams for <u>any</u> reason. Since we count the best two out of three midterms, if you have to miss one, we will just count that one as the one that will not enter your main grade. If you miss more than two midterms, you should consider dropping the class.
2. **Make-up final exam:** There will be **<u>no make-up or early final exam</u>**. The date & time of the final exam is published in this syllabus and it is your responsibility to arrange work schedules, vacations etc, in such a way that you can take the final. If that is not possible, consider taking this class at a later date when you have sufficient time.
3. **Laboratory credit**: If you sign up for the 4 credit version of this class you are expected to participate in the laboratory. If you are signed up for the lab, you MUST complete all your lab assignments. You can drop two lowest scored lab reports, i.e. to have 10 out of 12 labs. <u>However, if you miss more than 3 lab reports (i.e. submit less than seven reports altogether), you will receive a FAIL (F) for the entire course, even the lecture portion.</u>
4. **Incomplete:** As a rule I will not hand out any incomplete grades. Make sure to complete all necessary work during the semester or, if that is not possible, drop the class.
5. **Non-participating students:** If you are enrolled in this class, but do not show up or produce insufficient work, you will receive a Fail grade (F). This grade is final and will not be changed at a later date. So, if you decide to not show up to class anymore make sure to drop the class!!
6. **Grades:** Grades will be determined by the scheme in this syllabus on a numerical basis only. I will not accept any special pleading at the end of the semester. You know what grade you need, so work for it!
7. **Bonus**: There will be no extra bonus beyond what is published in this syllabus.
8. **Mathematics**: This course expects that you can do <u>arithmetic and simple algebra roughly at the level of high school that is required by the university for you to graduate</u>. If you are not able to do algebra on this level, please consult a book, such as Schaum's outline "Beginning Algebra".
9. **Cheating**: Any actual or attempted cheating will automatically result in a Fail grade (F) for the entire course, and a report to the university for further disciplinary action.

SCHEDULE:

Note: This schedule is subject to change, except for dates of exams. Latest version will be posted on the web.

DAY	TOPICS	READING:
M, 1/12	Intro, Math, Physics, The "Scientific method", Syllabus, Info about class	pp. 2 - 9
W, 1/14	Units, conversions, time, frequency, period, position, distance	pp. 9 - 18
F, 1/16	Speed, velocity, direction, vectors	pp. 18 - 22
M, 1/19	MLK day	N/A
W, 1/21	Vectors, vector addition	pp. 23 - 25
F, 1/23	Acceleration, free fall,	pp. 25- 30
M, 1/26	Types of motion	pp. 26 - 40
W, 1/28	Force, Newton's first law, mass	pp. 46 - 57
F, 1/30	Newton's first law demonstration. Newton's second law.	pp. 57 - 59
M, 2/2	Motions & forces. Examples.	pp. 60 - 66
W, 2/4	Newton's third law. Examples.	pp. 67 - 69
F, 2/6	The law of universal gravitation.	pp. 70-73
M, 2/9	Planetary orbits, tides	pp. 73-79
W, 2/11	**EXAM 1**	**Prologue, Chapters 1-2**
F, 2/13	Conservation laws, linear momentum, impulse	pp. 86 - 93
M, 2/16	Work, energy, potential & kinetic energy, energy conservation	pp. 99 - 110
W, 2/18	Collisions, power	pp. 111- 117
F, 2/20	Rotation and angular momentum	pp. 118 - 121
M, 2/23	Matter, atoms, molecules, density, pressure	pp. 128 - 146
W, 2/25	Fluid pressure, Archimedes' Pascal's and Bernoulli's principles	pp. 147 - 163
F, 2/27	Temperature, thermal expansion, 1st law of thermodynamics,	pp. 174 - 187
M, 3/2	Heat transfer, specific heat	pp. 188 - 197
W, 3/4	Phase transitions, humidity, heat engines, 2nd law of thermodynamics	pp. 198 - 210
F, 3/6	Waves: amplitude, frequency, wavelength, reflection	pp. 216 - 229
M, 3/9	Doppler effect, diffraction, interference,	pp. 230 - 237
W, 3/11	**EXAM 2**	**Chapters 3 - 6**
F, 3/13	Electricity, charge, Coulomb's law, electric field	pp. 260 - 269
3/16 - 3/21	**SPRING BREAK**	N/A
M, 3/23	Electric currents, Ohm's law, superconductivity	pp. 271 - 275
W, 3/25	Circuits, power, AC, DC currents	pp. 274 - 285
F, 3/27	Magnetism, electromagnetism, transformers	pp. 292 - 305
M, 3/30	EM waves, blackbody radiation	pp. 310 -323
W, 4/1	Light, optics, polarization, diffraction, interference	pp. 336 - 343
F, 4/3	Reflection, refraction, mirrors	pp. 345- 355
M, 4/6	Total internal reflection, lenses, image formation,	pp. 356- 364
W, 4/8	Lens formula, magnification, aberrations, dispersion, color	pp. 364- 367, pp. 373-375
F, 4/10	**EXAM 3**	**Chapters 7 - 9**
M, 4/13	Atomic physics, photons, blackbody radiation, photoelectric effect	pp. 390 - 398

W, 4/15	Atomic spectra, Bohr model	pp. 398-404
F, 4/17	Quantum Mechanics, Atomic structure	pp. 405 - 415,
M, 4/20	X-ray spectra, lasers, nuclear physics, radioactivity, half-life, radioactive dating, nuclear binding energy, fission, fusion	pp 428 – 439, pp. 439 - 458
W, 4/22	Special relativity 1	pp. 468-475
F 4/24	Special relativity 2	pp. 468-475
M, 4/27	Review	Everything
Tu, 4/28	Study day	
Tu, 5/5 8:00-10:30 am	**FINAL EXAM**	**Everything**

FINAL EXAM: **Friday, December 12 at 8:am**
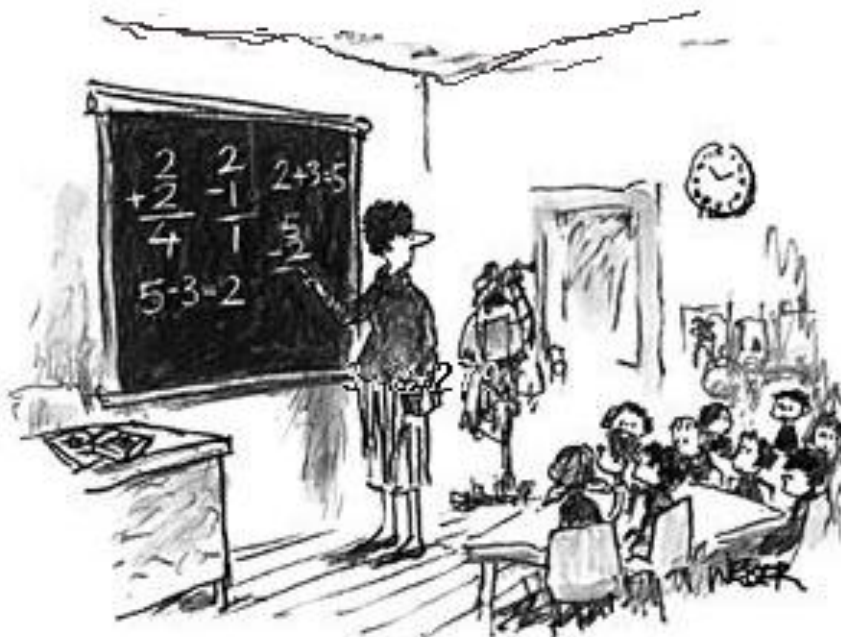
"Please, Ms. Sweeney, may I ask where you're going with all this?"