

**PHY 1122A**  
**FUNDAMENTALS OF PHYSICS II**

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**CLASSES**

- TUE. 8:30 am – 9:50 am
- FRI. 10:00 am – 11:20 am

**DG (Discussion Group)**

- MON. 8:30 am – 9:50 am
- WED. 4:00 pm – 5:20 pm

**OFFICE HOURS**

- TUE. 10:00 am – 11:00 am
- THU. 12:00 pm – 1:00 pm

**PHYSICS HELP CENTER**

- MON. 2:30 pm – 5:30 pm
- TUE. 5:30 pm – 8:30 pm
- WED. 2:30 pm – 5:30 pm, 7:00 pm – 8:30 pm
- THU. 4:00 pm – 7:00 pm

**COURSE OUTLINE**

▪ **FLUID MECHANICS**

- \*density, pressure
- \*Pascal's and Archimedes' principles, buoyancy
- \*surface tension, capillarity
- \*equation of continuity, Bernoulli's equation - applications
- \*viscosity and turbulence

▪ **THERMODYNAMICS**

- \*temperature, thermal equilibrium, zeroth law of thermodynamics
- \*thermal expansion of solids and liquids
- \*heat, work, first law of thermodynamics
- \*phase transitions, heat transfer
- \*kinetic theory of gases

- \*second law of thermodynamics - applications
- \*entropy and disorder, arrow of time
- \*third law of thermodynamics

#### ■ELECTROSTATICS

- \*Coulomb's law, electric field, Gauss' law
- \*electric potential, capacitors and dielectrics

#### ■CURRENT AND RESISTANCE

- \*Ohm's law
- \*electric charge and Coulomb's law
- \*superconductors and semiconductors
- \*electric energy and electric power
- \*Kirchhoff's rules, RC circuits

#### ■NATURE OF LIGHT

- \*measurements of the speed of light
- \*reflection and refraction
- \*Huyghens' principle
- \*total internal reflection

#### ■GEOMETRIC OPTICS

- \*images formed by plane and spherical mirrors
- \*thin lenses and lens aberrations
- \*the eye
- \*the optical instruments

#### ■INTERFERENCE OF LIGHT WAVES

- \*conditions for interference
- \*Young's double slit experiment
- \*phasor addition of waves
- \*change of phase due to reflection
- \*interference in thin films

#### ■DIFFRACTION AND POLARIZATION

- \*single slit diffraction
- \*resolution of single-slit and circular apertures
- \*the diffraction grating; holography
- \*diffraction of x-rays by crystals
- \*polarization of light waves

#### COURSE MATERIAL

- H.D. Young and R.A. Freedman, *Sears & Zemansky's University Physics*, 15<sup>th</sup> Edition
- Z.M. Stadnik, *PHY 1122A Lecture Notes*

- CHAPTERS IN THE TEXTBOOK: 12, 17–26, 33–36

## EVALUATION

- Mini quizzes (Q): 8% (6.4%)
- Mid-term exam one (M1): 11% (8.8%); Feb. 11, 2023, 8:30 am – 9:50 am, STEM 224
- Mid-term exam two (M2): 11% (8.8%); March 18, 2023, 8:30 am – 9:50 am, MRT 218
- Assignments (A) : 15% (12%)
- Final exam (F): 55% (44%)
- Laboratory (L): 20%
- Q are close-book, multiple-choice quizzes
- M1, M2, and F are open-book, multiple-choice exams

### Quizzes

■Five-minute mini quizzes will be written every class. They consist of four multiple-choice questions. They will be administered at a time selected by the lecturer. The same rules as those for an exam apply to writing a mini quiz.

■The students submit the answers **electronically**. A typical mini-quiz answer sheet should look like this:

#### QUIZ #4

■John BROWN, st. # 3000391245

- 1. D
- 2. C
- 3. E
- 4. A

### Assignments

■There will be five assignments per semester. An assignment consists of 10 problems. An assignment is an individual work of which the student should be the only author. Copying from fellow students and other forms of plagiarism will be considered academic fraud. The assignments are submitted via *MasteringPhysics*.

■Q, A, M1, M2, and L (laboratory) are compulsory

■Mid-term exams: 14 questions; each question is worth 7.15; maximum mark =  $14 \times 7.15 = 100.1$

■Final exam: 31 questions; each question is worth 3.23; maximum mark =  $31 \times 3.23 = 100.13$

## FINAL GRADE G

■LE (lecture mark) =  $0.08Q + 0.15A + 0.11M1 + 0.11M2 + 0.55F$

■G =  $0.8 \times LE + 0.2 \times L = 0.064Q + 0.12A + 0.088M1 + 0.088M2 + 0.44F + 0.2L$

## GRADES

Letter Grade	Percentage Scale
▪ A+	$89.50 \leq G \leq 100.00$
▪ A	$84.50 \leq G \leq 89.49$
▪ A-	$79.50 \leq G \leq 84.49$
▪ B+	$74.50 \leq G \leq 79.49$
▪ B	$69.50 \leq G \leq 74.49$
▪ C+	$64.50 \leq G \leq 69.49$
▪ C	$59.50 \leq G \leq 64.49$
▪ D+	$54.50 \leq G \leq 59.49$
▪ D	$49.50 \leq G \leq 54.49$
▪ E	$39.50 \leq G \leq 49.49$
▪ F	$0.00 \leq G \leq 39.49$

## PHY 1122A Pre-Class Reading

### #1. January 13, 2023

- ⇒ textbook: pp. 366–375
- ⇒ lecture notes: pp. 1–18

### #2. January 17, 2023

- textbook: pp. 376–384
- lecture notes: pp. 19–34

### #3. January 20, 2023

- textbook: pp. 541–560
- lecture notes: pp. 35–51

### #4. January 24, 2023

- ♣ textbook: pp. 561–567, 613–625
- ♣ lecture notes: pp. 51–66

### #5. January 27, 2023

- ∇ textbook: pp. 579–594, 597–602
- ∇ lecture notes: pp. 66–78

### #6. January 31, 2023

- ⊕ textbook: pp. 594–597, 625–631, 642–647, 651
- ⊕ lecture notes: pp. 79–91

### #7. February 3, 2023

- ◆ textbook: pp. 647–651, 652–664
- ◆ lecture notes: pp. 91–102

### #8. February 7, 2023

- textbook: pp. 664–668
- lecture notes: pp. 103–117

### #9. February 10, 2023

- ♠ textbook: pp. 678–693, 694–699
- lecture notes: pp. 118–129

### #10. February 14, 2023

- ♣ textbook: pp. 693–694, 700–705
- ♣ lecture notes: pp. 130–135

### #11. February 17, 2023

- ◆ textbook: pp. 718–737
- ◆ lecture notes: pp. 136–148

### #12. February 28, 2023

- ♠ textbook: pp. 747–769
- ♠ lecture notes: pp. 148–163

#13. March 3, 2023

- textbook: pp. 780–802
- lecture notes: pp. 164–182

#14. March 7, 2023

- textbook: pp. 812–834
- lecture notes: pp. 183–195

#15. March 10, 2023

- ☒ textbook: pp. 844–866
- ☒ lecture notes: pp. 195–206

#16. March 14, 2023

- textbook: pp. 1077–1085, 1088
- lecture notes: pp. 207–218

#17. March 17, 2023

- textbook: pp. 1085–1088, 1089–1090, 1099–1101
- lecture notes: pp. 218–222

#18. March 21, 2023

- 📖 textbook: pp. 1110–1126
- 📖 lecture notes: pp. 223–229

#19. March 24, 2023

- 📖 textbook: pp. 1127–1147
- 📖 lecture notes: pp. 230–245

#20. March 28, 2023

- textbook: pp. 1159–1176
- lecture notes: pp. 246–255

#21. March 31, 2023

- textbook: pp. 1185–1207
- lecture notes: pp. 256–265

#22. April 4, 2023

- textbook: pp. 1090–1098
- lecture notes: pp. 266–273

#23. April 7, 2023

- Grand Review