

AP PHYSICS C
Academy: Spring 2020
(Dual Credit with Ball State PHYC 122)
General Information

INSTRUCTOR: Hasan Fakhruddin

E-MAIL: hfakhrud@bsu.edu

OFFICE: Elliot B009B

PHONE: 285 7415;

OFFICE HOURS: M: 12 – 3 PM

W: 12 – 3 PM

F: 12 – 3 PM

Th: 12 – 2 PM

And by appointment

TEXT: 5 Steps to 5 for AP Physics C course

Calculus-based Physics Course

[Dual Credit with Ball State; 5 Cr. Hours in PHYCS 122]

This part 2 of the Academy Calculus-based Physics consists of all the topics in Electromagnetism, Fluid Static and Fluid Dynamics, Heat, and Thermodynamics. Laboratory work will be covered as an integral part of this course

EVALUATION:

Homework assignments: You will be assigned homework periodically at the end of various topics covered in class.

Tests: You will have three tests as indicated in Course Outline below.

Labs: You will have at least 10 labs each 2-hour long. Your lab performance will be graded on your participation in the actual experiment and the written report.

You must save all the graded lab reports for the entire academic year so that you can present the portfolio of your labs as a proof of having performed the labs when asked for an evidence for admission to colleges.

Final Exam : This will be a comprehensive Spring Semester exam.

MIDTERM GRADE: The midterm grade will be based on Homework (50%) and Tests (50%). Labs will not count toward mid-term grade; they will for the semester grade.

FINAL GRADE: The final grade will be determined from the combination of the following scores.

Homework	25%
Tests	25%
Lab	25%
Final	25%

GRADING SCALE (May be curved depending on the class performance):

92%	-	100%	=	A
88%	-	91%	=	A-
84%	-	87%	=	B+
82%	-	83%	=	B
78%	-	81%	=	B-
74%	-	77%	=	C+
72%	-	73%	=	C
70%	-	71%	=	C-
0%	-	69%	=	D*

POLICY FOR MAKE-UP WORK:

Make-up work will be allowed only for the excused absences. You must make arrangements for the make-up work before or immediately after the excused absence. You must make every effort to make contact with your instructor in this regard personally or by a written note, p-mail, or phone.

LATEWORK POLICY:

Late homework assignments may be accepted up to one week after the due date with a penalty of 20% of the maximum points on that assignment. However, if the delay is due to an excused absence or with valid reasons, the instructor may reduce or forego the penalty.

ACADEMIC PROGRESS REPORTS:

Your performance will be evaluated periodically through out the semester. If any problems is encountered an academic progress report will be sent out as per the Academy policy.

TARDY AND UNEXCUSED-ABSENCE POLICIES:

A student late to class/lab up to 5 minutes will be marked 'tardy'.

A student late to class/lab for more than 5 minutes will be marked 'absent'.

ACADEMIC DISHONESTY POLICY:

Academic dishonesty may be detrimental to a student's grade for the course.

Academy dishonesty includes but is not limited to:

- Plagiarism
- Manipulating lab data to obtain expected results
- Copying lab report from another student
- Copying in the tests and exams

For details, please refer to the Academic Dishonesty Policy in the Student's Handbook

USE OF LAPTOP COMPUTERS IN CLASSROOM

1. You may use the laptop in the lecture. You have option of writing notes on your laptop or in traditional notebook.
2. Unless told otherwise, please boot up your computer as soon as you arrive in class so that you will be ready to go to work as soon as class starts.
3. You are responsible for maintaining the power of your computer.
4. Keep your laptop on until the class ends for the day.
5. The volume on your laptop should be turned all the way down during class. Your laptops should be silent except for the clicking of the keyboard.
6. You may not read or send e-mail, play music or games, "IM", participate in chat rooms, or download any files during class. If this becomes a chronic problem, you will be asked to leave the classroom, with an unexcused absence for that day.
7. You may take class notes using your laptop, but you also need to be prepared to use pen and paper when asked.
8. You are responsible for maintaining your computer. Please make sure your computer is working before coming to class. If your computer is not working or is not able to connect to the wireless server, you should follow the help instructions in your laptop management document.
9. Print assignments before coming to class.
10. Remember to save your work frequently. Loss of a file by accident is not an acceptable excuse.
11. Close your lid/screen half way during discussions or class presentations or when otherwise requested by the instructor.
12. Do not hide toolbars (the dock). Keep all items you are working on visible on the screen and available for teacher inspection.
13. Do not bring you laptop to an exam.

Ball State University's Statement on the Importance of Diversity and Inclusion

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. Ball State is committed to ensuring that all members of the campus community are welcome through our practice of valuing the varied experiences and worldviews of those we serve. We promote a culture of respect and civil discourse as evident in our [Beneficence Pledge](#).

At Ball State, diversity is an integral part of our identity. Our success depends on our efforts to cultivate inclusivity within our pedagogical, scholarly, and creative pursuits. Community is an inherent and crucial aspect of such efforts at local, national and international levels. As we recruit and retain a diverse administration, faculty/staff and student body, we strive to ensure that our students are prepared to engage and succeed in increasingly diverse environments. Our recruitment efforts will continue to include historically underrepresented populations to create the cultural milieu that promotes participation by all.

We are committed to the pursuit of excellence by being inclusive of individuals without regard to race, religion, color, sex (except where sex is a bona fide qualification), sexual orientation, gender identity/gender expression, physical or mental disability, national origin, ancestry, or age. Ball State will be a place recognized for its positive climate—one where all stakeholders know that their contributions to the mission of the university are essential to our success.

Ball State University is committed to:

- creating innovative [courses](#), [programs](#), and practices that attract, retain, and nurture a diverse university community
- fostering a university environment that enables all who contribute to excel in a culture that is growing ever more diverse

Whereas other initiatives focus on particular aspects of diversity, our equal opportunity and affirmative action policies use a broad definition of diversity referring to race, religion, color, gender, sexual orientation, physical or mental disability, national origin, ancestry, age, and citizenship.

The Office of Institutional Diversity is not only committed to diversity programming for students; it also support several faculty development programs as well. The [Diversity Associates Program](#), the Developing Pedagogies to Enhance Excellence Seminar, and the [Diversity Seminars](#) are three programs that encourage faculty to explore the relevance of diversity in all classes.

General Physics - Spring 2020 – Syllabus *(Tentative)*

Jan. 6 – Feb. 13

Static Electricity
Electric Field and Electric Potential
Coulomb's Law
Gauss' Law
Current Electricity – Ohm's Law and Kirchhoff's Rules
CR-circuits

Friday Feb. 14 TEST 1

Feb. 17 – Apr. 16

Magnetism
Magnetic force on a moving charge and electric current
Biot-Savart's Law
Ampere's Law
Electromagnetic Induction
Maxwell's Equations

Friday Apr. 17 TEST 2

April 20 – May 1

Geometrical Optics
Reflection and Refraction
Image Formation by Plane and Spherical Mirrors
Image formed by Thin Lenses

Physical Optics
Superposition of Wave
Interference
Refraction
Polarization

Theory of Relativity
Photoelectric Effect
Atomic Physics
Nuclear Physics
Traveling Waves
Properties of Sound
Standing Wave and Beats
Doppler Effect

May 4 - May 8

Final Exam (comprehensive)

Semester final is Comprehensive

Spring Labs

(2 hours durations each)

(At least 10 of the following labs will be done)

These labs involve error analysis.

1. Electrostatics

This lab involves

Construction of Electroscope

Determination of the nature of electric charges on two (non-conducting) objects rubbed together

Ordering the objects according to their electronegativity

2. Electric Field Mapping

This lab involves

Constructing Equipotential lines using carbon soaked papers, electrodes, power supply and voltmeter

Constructing Electric Field Lines orthogonal to equipotential lines and going from + to negative charges.

3. Ohm's Law

This lab involves

Assembling a circuit with resistor, voltage supply, switch, ammeter, and voltmeter

Collection of V vs I data

Verification of Ohm's Law from graphical analysis

Determination of the resistance from the graph

4. Series-Parallel Resistive Circuits

This lab involves

Designing various series-parallel combination circuits

Theoretical prediction of the resistance of each circuit

Experimental verification of the resistance of each circuit

5. RC circuits

This lab involves

Measurement of V and I as a function of time and verifying the formula for time constant.

6. Standing Waves on a String

This lab involves

Adjusting frequency, tension, and/or string length to produce standing waves on the stretched string

Verifying the equation for speed of the wave on the string by graphical analysis.

7. Standing Waves of sound in a Pipe

This lab involves

Adjusting the length of a tube closed at one end to generate standing sound waves for each of the given tuning forks

Graphical analysis of the data to determine the speed of sound in air.

8. Verification of the Laws of Reflection and Refraction

This lab involves

Using laser, a glass slab, and measurement of angles to

Verify the law of reflection

Verify the law of refraction

9. Image formation by Spherical Mirrors and Lenses

This lab involves

Determine the focal length of converging mirrors and lenses by obtaining real image of an object on a screen

10. Young's Double-Slit Experiment

This lab involves

Determination of wavelength of a given laser light using two slits cut in a slide

11. Single Slit Diffraction and Diameter of Hair

This lab involves

Determination of diameter of a piece of hair using diffraction of a laser beam

12. Simulation of radioactivity

This lab involves throwing 100 six-sided dice to simulate half-life.