



Course Number: PHY 213
Semester: Fall 2024
Schedule: MWF: 10:00-10:50 am (SAMC 355)
Instructor: Ram Rai, PhD
Office Hours: WF: 11 am-noon or by appointment
Phone: 878-3767

Course Name: University Physics III
CRN: 1813
Mode: Traditional
Email: rairc@buffalostate.edu
Office Location: SAMC 280

Course Description:

It is a calculus-based introductory physics course in sequence with PHY 111 and PHY 112. This course covers: kinetic theory, physical optics, classical wave motion, and interference phenomena.

Prerequisite: PHY 108 or PHY 112 or Instructor permission

Enrollment Restrictions: Required for physics majors

Required Materials:

Textbook: Fundamentals of Physics, Vol. III by Halliday, Resnick, and Walker, 10th Edition, Wiley, 2016. ISBN: 9781119268024.

Student Learning Outcomes:

- After taking this course, students should be able to
- Apply physical models to practical situations to solve qualitative and quantitative problems; explain phenomena, analyze the behavior of systems using physical models and principles.
- Describe, analyze, and predict properties of light in interactions with materials (such as glasses and metals) with optical devices (such as diffraction gratings, spectrometers, and interferometers).
- Use appropriate mathematical techniques (such as calculus, complex variables,) to calculate interference and diffraction effects.
- Analyze the thermodynamic properties of materials using concepts (such as temperature, heat, energy, entropy)
- Compare the properties of real gases with the Ideal gas model.

Course Requirements:

You **MUST** read the chapter that will be covered before attending the class to follow the lecture. You must make every effort to do all assigned homework problems not only to get a good grade, but also to improve your problem-solving skills and grasp of theoretical topics. Students are expected to know basic calculus and basic trigonometric functions such as sine, cosine, tangent, and so on. A scientific calculator is extremely useful for solving problems, and I strongly recommend that you have one. Students who are having difficulty following the lecture/discussion should meet with the instructor and discuss their difficulties individually. You should check the Brightspace course website frequently for homework/solutions and other announcements.

Homework, Quizzes, and Exams:

All weekly homework sets should be completed in a hard copy before the specified time. You should show every important step of the answer, and the final answer must be labeled with the appropriate unit. I strongly encourage you to collaborate with other students in working on the problems, but the final write-up must be written in your own words. Answers to the problems will be posted on **Brightspace**. **No late homework will be accepted without a reasonable excuse. Late homework will be penalized with 20% within the next week, however homework will not be accepted after the solution is posted.** Reading quizzes will be given occasionally either at the beginning or at the end of class. There will be three one-hour exams and one two-hour (comprehensive) final exam. Note that all exams are closed-book exams. You must inform me at least a week ahead, if you know you are going to miss the scheduled exams. I can reschedule the exam for you, **only if** you have a valid reason.

Attendance:

Regular attendance is necessary for this course even though attendance will not be taken during lectures. Exams, homework assignments, and quizzes are announced in class. It is your obligation to review the content covered in class if you are absent.

Class Participation:

Students are urged to participate in class discussions and ask questions. We often work in groups of two to three students to develop problem-solving skills. Throughout the semester, several in-class quizzes will be given to both individuals and groups.

Evaluation and Grading Scale:

Final grades in the course will be based on the following:

Grades will be distributed as follows:

Exams (3 Exams)	60%
Homework and quizzes	15%
Final Exam	25%

Overall Percentage	Grade
90.0 - 100	A
86.0 - 89.9	A-
82.0 - 85.9	B+
78.0 - 81.9	B
74.0 - 77.9	B-
70.0 - 73.9	C+
66.0 - 69.9	C
62.0 - 65.9	C-
58.0 - 61.9	D+
50.0 - 57.9	D
< 50	E

Course Schedule: Chapters are from **Fundamentals of Physics, Vol. III** by Halliday, Resnick, and Walker, 10th Edition).

Week 1: Aug 26 – 30 Homework: Due Sep 6	Ch 33: Electromagnetic Waves (Sec: 1-4) HW Set #1 (Problems from Ch 33): 2, 6, 15, 16, 19, 22, 30, 32, 36, 38
Week 2: Sep. 3 – 6 (Sep. 2: Labor Day)	Ch 34.5: Optical Instruments
Week 3: Sep 9 – 13	Ch 34.5: Optical Instruments Ch 35: Interference
Week 4: Sep 16 – 20	Ch 35: Interference Exam #1: Sep. 20 (Friday)
Week 5: Sep 23 – 27	Ch 36: Diffraction
Week 6: Sep 30 – Oct 4	Ch 36: Diffraction
Week 7: Oct 7– 11	Ch 16: Waves - I
Week 8: Oct 16 – 18 Fall Recess: Oct 14 - 15	Ch 16: Waves - I Exam #2: Oct. 18 (Friday)
Week 9: Oct 21 – 25	Ch 17: Waves - II
Week 10: Oct 28 – Nov 1	Ch 17: Waves - II Ch. 18: Temp, Heat, and the First Law of Thermodynamics
Week 11: Nov 4 – 8	Ch. 18: Temp, Heat, and the First Law of Thermodynamics
Week 12: Nov 11 - 15	Ch 19: The Kinetic Theory of Gases Exam #3: Nov 15 (Friday)
Week 13: Nov 18 – 22	Ch 19: The Kinetic Theory of Gases
Week 14: Nov 25 – 26 Thanksgiving: Nov 27-29	Ch 20: Entropy and the Second Law of Thermodynamics
Week 15: Dec 2 – Dec 6	Ch 20: Entropy and the Second Law of Thermodynamics
Week 16: Dec 9 – 12 (CEP)	Final Exam: 9:40 am – 11:30 am, Dec. 11 (Wednesday), 2024

This course outline is tentative and subject to revision as the semester progresses.

Student Resources:

Title IX:

My priority as your professor is to ensure a safe, respectful education environment where all students can learn and thrive. The University does not tolerate any form of discrimination or harassment (including sexual assault, dating and domestic violence, stalking) based on protected characteristics (e.g., sex, gender identity, sexual orientation, religion, pregnancy, etc.) or related retaliation. All faculty and teaching assistants are considered mandated reporters by the University, which means that if they observe or learn of sex-based harassment/ discrimination or related retaliation, they are obligated to immediately share that information with the University's Title IX Coordinator. This obligation, grounded in law and policy, is designed to protect the safety of students and the broader Buffalo State community, as well as to ensure that students receive information about available supportive measures and resolution options to enable them to make informed choices. Supportive measures include reasonable academic accommodations available with or without the filing of a formal complaint.

If you need academic accommodations due to sex discrimination, harassment, or related retaliation, you may:

On Campus Resources:

- Contact the TIX Coordinator directly (titleix@buffalostate.edu or 716-878-5212), without sharing any personal information with me.
- If you would like to speak with a **confidential** counselor about sexual misconduct, [The Counseling Center](#) provides 24/7 confidential support for students via the Bengal Support Line (833-823-0260), or by scheduling an appointment at 716-878-4436.
- If you are a student with a disability and require reasonable accommodations to meaningfully participate in this course, please contact the University's [Student Accessibility Services](#) at your earliest convenience (sas@buffalostate.edu or 716-878-4500), as SAS is responsible for processing and approving such requests.
- If you are pregnant, have recently experienced childbirth, and/or have medical needs related to childbirth, please contact our Title IX Coordinator for assistance.
- You can file an [anonymous report](#) with our University Police Department: 716-878-6333, police@buffalostate.edu

Off Campus Resources

- Crisis Services: 24/7 hotline, 716-834-3131
- National Suicide Prevention Lifeline: 1-800-273-8255
- Family Justice Center: 716-558-7233, safe@fjcsafe.org

Tutoring: Buffalo State offers a wide array of FREE tutoring services: Math Center, Writing Center, Other Subject Tutoring Center, STAR-NY online tutoring, and EOP/ACE. Most tutoring is face-to-face in the Academic Commons area of Butler Library. For details check out the tutoring website: <https://academicsuccess.buffalostate.edu/tutoring>.

Support: The Dean of Students Office helps students navigate the college experience, particularly during difficult situations such as personal, financial, medical, and/or family crises. If you or someone you know needs support, services are available. For a list of support services and information, please visit <http://deanofstudents.buffalostate.edu/>, 716-878-4618 or stop by 311 Campbell Student Union during business hours.

Policy on Cell Phone Use:

During the class, cell phones and other electronic devices must be turned off or set to SILENCE.

Academic Misconduct:

All students at Buffalo State College are expected to display honesty and integrity in completing course requirements. "Academic misconduct" refers to any form of plagiarism or cheating on examinations or assignments and is inconsistent with the aims and goals of Buffalo State College. The violation of "Academic Misconduct Policy" will lead to an "E" grade in this course. For details, visit the website at <https://academicstandards.buffalostate.edu/misconduct>.

Students with Disabilities:

Students who require accommodations to complete the requirements and expectations of this course because of a disability are invited to make their needs known to the Student Accessibility Services Office, Butler Library 160, (716) 878-4500, or email sas@buffalostate.edu.

Procedures Regarding Disruptive Individuals:

Disruptive behavior (cell phones, talking, noise, tardiness, etc.) by students in my class will not be tolerated. Whenever I deem a student to be acting in a disruptive or threatening manner, I will exercise my right to ask that individual to leave the classroom. If refused, I will exercise my right to notify University Police. The responding officer will determine whether an arrest should be made or whether a referral to medical or counseling staff is appropriate. If a student is perceived as a danger to themselves or others, the Dean of Students may propose an interim suspension until a hearing is held. Any student removed from class will have the right to a hearing.

For details, see <https://facultyhandbook.buffalostate.edu/disruptive-students>