Ball State University
Course Syllabus for Nuclear Physics (PHYC 463)
Fall 2026

Instructor: Dr. Michael J. Skoby

Catalog Description:

Nucleus and nuclear interactions. Emphasizes experimental facts about nuclear processes in discussions of particle accelerators, detectors, radioactivity (alpha, beta, and gamma decay), interaction of radiation with matter, nuclear reactions, nuclear structure, nuclear models, and nuclear applications in science and technology. Prerequisite: PHYC 260.

Required Materials:

Lilley, J. S. *Nuclear Physics: Principles and Applications.* Wiley, 2001

Course Grading:

Your final grade will be weighted as follows:

Homework:	50%
Exam 1:	15%
Exam 2:	15%
Final Exam:	20%

Below is the grading scale. The letter grade thresholds may be lowered at the instructor's discretion, but the thresholds will not be raised. For example, if you get at least 90% you will be guaranteed to receive an A- or possibly better.

A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
F	Below 60%

Homework:

Homework problems will generally be assigned for each lecture and the due date will be given once all the problems for a homework set have been assigned. You are encouraged to discuss the homework with others, but each student must do their own work. Solutions copied from any source (online, classmates, etc.) will not be accepted. Late homework will not be accepted.

Please follow these guidelines when writing your homework solutions:

- Solutions must be legible, organized, and logical. No scratch work, nothing scribbled out or crossed out. Please don't try to cram everything into as little space as possible. Don't be afraid to use lots of paper.
- You must cite or show how you got an equation (please don't just say "the notes", include the date and context). You don't have to cite general equations (e.g. Newton's Laws, conservation of energy, conservation of momentum,, etc.), but you should label them in your solutions.
- Show all steps to the solution including the algebra. Students that show the fewest number of steps tend to be the ones that make the most mistakes.
- Don't assume that I'll assume you understand what you're doing. Include concise explanations of your solution.
- Draw a box around your final answer(s).

Exams:

The date and material covered on exams will be confirmed a week before the exam.

Attendance:

Students are expected to be present for every lecture and assigned lab section. Only exceptional cases (e.g., illness) will be considered excused, and students are still responsible for homework assigned and all material covered in class. *You must contact the instructor before missing class for an excused absence and you may be required to provide the instructor with supporting documentation (please redact confidential information).*

Please be on time and only leave when dismissed.

University Statement:

We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse.

Disability Statement:

If you need course adaptations or accommodations because of a disability, please contact the instructor of record as soon as possible. Ball State's Disability Services Office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

No Generative AI Use:

All work produced and/or submitted in this course should reflect your own ideas and demonstrate your current knowledge, abilities, and skills. Therefore, generative AI should not be used to complete any portion of the assignments. Doing so constitutes a violation of Ball State University's Student Academic Ethics Policy.

Student Academic Ethics Policy:

Honesty, trust, and personal responsibility are fundamental attributes of the university community. Academic dishonesty and other forms of academic misconduct threaten the foundation of an institution dedicated to the pursuit of knowledge and will not be tolerated. To maintain its credibility and reputation, and to equitably assign evaluations of scholastic and creative performance, Ball State University is committed to maintaining a climate that upholds and values the highest standards of academic integrity. Visit the VPAA's academic integrity website (Students tab) for resources on understanding academic integrity, citing sources properly, and avoiding inadvertent academic dishonesty. To learn about BSU's academic integrity expectations and students' rights, please read the University Student Academic Ethics Policy.

Tentative Course Topics:

Nuclear Properties
Forces Between Nucleons
Nuclear Models
Radioactive Decay
Radiation Detection
Nuclear Reactions
Accelerators
Applications of Nuclear Physics

Disclaimer: This syllabus is subject to change.