

PHYSICS 2203

Introductory Physics III: Modern Physics

Fall 2026

Course Information

Instructor: Jackson Burzynski, Assistant Professor of Physics
Grader: Phu Trong Nguyen
Office hours: MWF 10:00–11:00 or by appointment
Office address: Nielsen Hall, Room 343
Email address: burzynski@ou.edu

Lectures: MWF 9:00 to 9:50 in Nielsen Hall, Room 251

Course Prerequisite: PHYS 1215 or PHYS 2514 (or concurrent enrollment)

Required Materials

1. *Modern Physics* (2nd edition) by Randy Harris (ISBN: 9780805303087)
2. Top Hat account (<https://tophat.com>)
3. *Physics for Scientists and Engineers* (6th Edition) by Gene Mosca and Paul A. Tipler, relevant chapters are posted on Canvas

Canvas Website

Homework assignments, homework solutions, announcements, exam preparation materials, and other important information will be posted on the Canvas website (<https://canvas.ou.edu>). To log on to Canvas, you will need to know your OUNetID or username (sometimes referred to as your “4 plus 4”) and password. If you do not know your username and password, contact the OU Information Technology Department at 325-HELP for assistance.

Office Hours

Please take advantage of the opportunities to interact with the instructor and your classmates. Discussing physics is a very important component of learning physics. Dr. Burzynski has three office hours per week. He is also available by appointment.

Top Hat

We are using the Top Hat system for tracking class participation. This requires that you have a Top Hat account (<https://tophat.com>), which is free for OU students, and an internet-connected device to access Top Hat during lectures. You will be asked questions to test your understanding and submit your answers using Top Hat. On many questions you will be allowed (even encouraged!) to discuss your answer with your neighbor before voting.

Course Summary

This course is an introduction to and overview of some key concepts in contemporary physics with emphasis on the contrast between classical and modern ways of thinking about the physical universe. There are three parts to the course:

1. **Light:** We will cover electromagnetic waves and their associated phenomena such as geometrical optics, wave diffraction, and emission spectra.
2. **Relativity:** Our inquiries into light will lead us to consider the speed of light and how mechanical systems behave as objects approach this velocity.
3. **Quantum Mechanics:** Light waves and spectra will in turn raise issues about the nature of matter on a microscopic scale. We will be forced to consider the contradictions of classical physics with experiments on this small scale.

Grading

%	Component	Details
50%	Midterm Exams	The midterm exams are in the evenings: 7:30–9:00pm! Exam 1 – Tuesday September 29 (tentative) Exam 2 – Tuesday November 3 (tentative) Exam 3 – Thursday December 3 (tentative)
20%	Final Exam	Tuesday December 15, 8:00 to 10:00 am, in Nielsen Hall, Room 251
20%	Homework	About one assignment per week. Solutions posted on the Canvas website after due date. Late submissions accepted until the solutions are posted.
10%	Class Participation	Several questions per lecture, answered using the Top Hat system. Students are encouraged to ask questions during class.

AI Policy for Homework

The use of generative AI tools (e.g., ChatGPT, Claude, Gemini) to complete homework assignments is strongly discouraged. Learning to struggle through difficult problems is a very important part of learning physics. The effort you put into working through a problem on your own is what builds the understanding and problem-solving skills needed to be a successful physicist! If you rely on AI to produce your homework solutions, you will struggle on the exams, where no such tools are available and which together account for 70% of your grade. Working together with your classmates on homework, on the other hand, is allowed and encouraged! Discussing physics with your peers is one of the most effective ways to learn it.

Syllabus

1. Propagation of Light (Mosca and Tipler, Chapters 30 and 31)
2. Optical Images (Mosca and Tipler, Chapter 32)
3. Interference and Diffraction (Mosca and Tipler, Chapter 33)

4. Special Relativity (Harris, Chapter 2)
5. Electromagnetic Radiation Behaving as Particles (Harris, Chapter 3)
6. Matter Behaving as Waves (Harris, Chapter 4)
7. Bound States in Quantum Mechanics (Harris, Chapter 5)
8. Unbound States in Quantum Mechanics (Harris, Chapter 6)
9. The Hydrogen Atom (Harris, Chapter 7)

Exams

- Exam 1 will cover Chapters 30 to 33 in Mosca and Tipler (approximately)
- Exam 2 will cover Chapters 2 and 3 in Harris (approximately)
- Exam 3 will cover Chapters 4 and 5 in Harris (approximately)
- The Final Exam will be cumulative: Tuesday December 15, 8:00 to 10:00 am, in Nielsen Hall, Room 251

University Policies

Mental Health Support Services

Support is available for any student experiencing mental health issues that are impacting their academic success. Students can either be seen at the University Counseling Center (UCC) located on the second floor of Goddard Health Center or receive 24/7/365 crisis support from a licensed mental health provider through [TimelyCare](#). To schedule an appointment or receive more information about mental health resources at OU please call the UCC at 405-325-2911 or visit [University Counseling Center](#). The UCC is located at 620 Elm Ave., Room 201, Norman, OK 73019.

Title IX Resources and Reporting Requirement

The University of Oklahoma faculty are committed to creating a safe learning environment for all members of our community, free from sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX. There are resources available to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you have (or someone you know has) experienced any form of sex-based discrimination or violence and wish to speak with someone confidentially, please contact [OU Advocates](#) (available 24/7 at 405-615-0013) or [University Counseling Center](#) (M-F 8 a.m. to 5 p.m. at 405-325-2911).

Because the University of Oklahoma is committed to the safety of you and other students, and because of our Title IX obligations, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report sex-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and

during Student/Office Hours. You may also choose to report directly to the Institutional Equity Office. After a report is filed, the Title IX Coordinator will reach out to provide resources, support, and information and the reported information will remain private. For more information regarding the University's Title IX Grievance procedures, reporting, or support measures, please visit [Institutional Equity Office](#) at 405-325-3546.

Adjustments for Pregnancy and Related Issues

Should you need modifications or adjustments to your course requirements because of pregnancy or a pregnancy-related condition, please request modifications via the [Institutional Equity Office](#) website or call the Institutional Equity Office at 405/325-3546 as soon as possible. Also, see the Institutional Equity Office [FAQ on Pregnant and Parenting Students' Rights](#) for answers to commonly asked questions.

Reasonable Accommodation Policy

The University of Oklahoma (OU) is committed to the goal of achieving equal educational opportunity and full educational participation for students with disabilities. If you have already established reasonable accommodations with the Accessibility and Disability Resource Center (ADRC), please log into [AIM](#) to request your semester accommodations as soon as possible and contact me privately, so that we have adequate time to arrange your approved academic accommodations.

If you have not yet established services through ADRC, but have a documented disability and require accommodations, please complete [ADRC's pre-registration form](#) to begin the registration process. ADRC facilitates the interactive process that establishes reasonable accommodations for students at OU. For more information on ADRC registration procedures, please review their [website](#). You may also contact them at (405)325-3852 or adrc@ou.edu, or visit www.ou.edu/adrc for more information.

Note: disabilities may include, but are not limited to, mental health, chronic health, physical, vision, hearing, learning and attention disabilities, pregnancy-related. ADRC can also support students experiencing temporary medical conditions.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [See [Faculty Handbook 3.15.2](#)]

Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's [Final Exam Preparation Period policy](#).

Emergency Protocol

During an emergency, there are official university [procedures](#) that will maximize your safety. **Severe Weather:** If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather.

1. Look for severe weather refuge location maps located inside most OU buildings near the entrances.
2. Seek refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. Go to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. Get in, Get Down, Cover Up
5. Wait for official notice to resume normal activities.

Additional [Weather Safety Information](#) is available through the Department of Campus Safety.

The University of Oklahoma Active Threat Guidance

The University of Oklahoma embraces a Run, Hide, Fight strategy for active threats on campus. This strategy is well known, widely accepted, and proven to save lives. To receive emergency campus alerts, be sure to update your contact information and preferences in the account settings section at [one.ou.edu](#).

RUN: Running away from the threat is usually the best option. If it is safe to run, run as far away from the threat as possible. Call 911 when you are in a safe location and let them know from which OU campus you're calling from and location of active threat.

HIDE: If running is not practical, the next best option is to hide. Lock and barricade all doors; turn off all lights; turn down your phone's volume; search for improvised weapons; hide behind solid objects and walls; and hide yourself completely and stay quiet. Remain in place until law enforcement arrives. Be patient and remain hidden.

FIGHT: If you are unable to run or hide, the last best option is to fight. Have one or more improvised weapons with you and be prepared to attack. Attack them when they are least expecting it and hit them where it hurts most: the face (specifically eyes, nose, and ears), the throat, the diaphragm (solar plexus), and the groin.

Please save OUPD's contact information in your phone.

NORMAN campus: For non-emergencies call (405) 325-1717. For emergencies call (405) 325-1911 or dial 911.

TULSA campus: For non-emergencies call (918) 660-3900. For emergencies call (918) 660-3333 or dial 911.

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates:

1. **LEAVE** the building. Do not use the elevators.
2. **KNOW** at least two building exits
3. **ASSIST** those that may need help

4. **PROCEED** to the emergency assembly area
 5. **ONCE** safely outside, **NOTIFY** first responders of anyone that may still be inside building due to mobility issues.
 6. **WAIT** for official notice before attempting to re-enter the building.
- [OU Fire Safety on Campus](#)