

Introduction to Modern Physics
PHYS 2305
Syllabus
Spring 2023

Course Description:

An elementary survey of the modern concepts in physics and their applications; relativity, quantum mechanics, atomic physics, solid state physics, nuclear and particle physics. Prerequisites: Math 2222 and Physics 2135 or 2111.

Instructor:

Jim Musser, Ph.D.

Physics 122

musserj@mst.edu

(Office hours to be set in consultation with students to find most effective time.)

Textbook:

Modern Physics for Scientists and Engineers, 5th Ed.

By Stephen T. Thornton, Andrew Rex and Carol Hood

ISBN: 978-1-337-91945-6

Course Work:

Assignments (TBA) 40%

Exams (3) 60%

Grading Scale:

≥89.5% A

≥79.5% B

≥69.5% C

≥59.5% D

<59.5% F

Assignments:

Homework problems will be assigned throughout the semester.

In addition, in-class assignments and quizzes may be collected.

There will be an automatic penalty for late submission of homework problem solutions. In-class assignments/quizzes that are missed due to an unexcused absence will earn a score of zero.

Exams:

There will be three exams. See schedule for topics covered in each exam. Note that the third exam will be given during the final exam period.

Absences:

If you are required to be absent due to participation in an official university-sponsored event, inform the instructor in advance.

If you are sick or must miss class due to circumstances beyond your control, inform the instructor as soon as possible.

If you are absent for any reason, it is your responsibility to inform the instructor and discuss with the instructor if and what arrangements may be made to address missed instruction.

In accordance with university policy, students with excessive absences may be dropped from the course.

Schedule: (chapter in parentheses)

- The Birth of Modern Physics (1)
- Special Theory of Relativity (2)
- The Experimental Basis of Quantum Physics (3)
- Structure of the Atom (4)
- Wave Properties of Matter and Quantum Mechanics I (5)

Exam I (February 15 in class, Date subject to change)

- Quantum Mechanics II (6)
- The Hydrogen Atom (7)
- Atomic Physics (8)
- Statistical Physics (9)
- Molecules and Solids (10)

Exam II (April 5 in class, Date subject to change)

- Semiconductor Theory and Devices (11)
- The Atomic Nucleus (12)
- Nuclear Interactions and Applications (13)
- Particle Physics (14)
- Modern Astronomy and General Relativity (15)

Exam III (Thursday, May 11, 10:00 am – 12:00 pm)

S&T Campus-Wide Policies

Statement about Copyright, FERPA, and Use of Video

It is vitally important that our classroom environment promote the respectful exchange of ideas. This entails being sensitive to the views and beliefs expressed during discussions, whether in class or online. Please obtain instructor permission before recording any class activity. It is a violation of University of Missouri policy to distribute such recordings without authorization and the permission of all who are recorded. More information is provided [online](#).

Accessibility and Accommodations

It is the university's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on a disability, please contact Student Accessibility and Testing at (573) 341-6655, email dss@mst.edu, or visit <https://saat.mst.edu/> for information.

Student Honor Code and Academic Integrity

- All students are expected to follow the [Honor Code](#).
- [Student Academic Regulations](#) describes the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism, and sabotage, any of which will be reported to the Vice Provost for Undergraduate Education.
- Other resources for students regarding academic integrity can be found [online](#).

Student Well-Being

Student Well-Being provides counseling services, health promotion initiatives, and prevention programs to empower the S&T community to thrive and enhance personal, academic, and professional success. Department office hours are Monday-Friday, 8 a.m. – 5:00 p.m. On the website, you can find information related to individual and group counseling, wellness consultations and trainings, resources for many health and wellness topics, and help for mental health crisis situations.

Health and Well-Being Canvas Course

The Health and Well-Being Canvas Course features trainings, presentations, and other health and well-being resources for students. The course is free for all students, is non-credit, and students can enroll at any point in the semester.

Miner Well-Being Certification Program

The Miner Well-Being Certification Program is a semester-long certification where students can engage with campus-wide services and initiatives that help develop skills that contribute to personal well-being and success. Housed in MinerLink, students can start the certification at any time in the spring or fall semesters, but it must be completed before the end of the semester in which they started it. Participants who finish the program will receive a certification of completion signed by the director of the Student Well-Being department, a letter of recommendation, and a badge in MinerLink.

Student Support and Community Standards knows student life can be difficult. During your time at Missouri S&T, you may have a friend or peer who needs help navigating their student experience, facing a challenge, or experiencing distress and could benefit from support and connection to resources. You are not alone. We have a dedicated team of Care Managers, numerous resources, and services to support you or your student, friend, or peer. This includes emergency funding support for unexpected emergency expenses. To learn more [visit](#) or [apply online](#).

Nondiscrimination, Equity, and Title IX

Missouri S&T is committed to the safety and well-being of our campus community, and to creating an environment free from discrimination and harassment.

The University does not discriminate on the basis of race, color, national origin, ancestry, religion, sex, pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, and any other status protected by applicable state or federal law. As used in this policy, the word “sex” is also inclusive of the term “gender.”

Additionally, US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Sexual harassment violations of this law include quid pro quo, hostile environment, sexual assault, dating/domestic violence, and stalking. The U.S. Department of Education has stated the prohibition on discrimination on the basis of sex includes sexual orientation and gender identity.

Students who are experiencing pregnancy or pregnancy-related conditions, including the birthing parent and non-birthing parent, have rights protected under Title IX. Students should contact the Office of Equity and Title IX to learn more about their rights and pregnancy-related assistance/accommodations provided by the University to ensure equitable access to University educational programs and activities.

In accordance with the University of Missouri’s Collected Rules and Regulations, all faculty and staff are required to report any information concerning discrimination disclosed through communication including, but not limited to, direct conversation, email, social media, classroom papers and homework exercises to the Equity Officer/Title IX Coordinator.

Office of Equity and Title IX

Equity Officer and Title IX Coordinator: Dr. Paul Hirtz

Phone: (573) 341-7734

Location: 900 Innovation Drive, Suite 500

E-mail: equity@mst.edu

Classroom Egress Maps

Classroom egress maps are posted at <http://designconstruction.mst.edu/floorplan/>.

Writing Center

The Writing Center's mission is to assist all students in their efforts to become better writers, communicators, and critical thinkers. The Writing Center's peer consultants provide free individualized one-on-one and small-group conversations to offer meaningful feedback and guidance to students across all disciplines. More information can be found on their website and through email: writing@mst.edu.

Student Success Center

The Student Success Center (SSC) provides additional assistance for students academically and helps bolster non-academic life skills, such as goal setting and time-management. The SCC offers individualized tutoring, peer-to-peer life skill coaching, and campus programming while providing free coffee and hot beverages! All student Miners are encouraged to utilize the SSC's free services to get timely support and to enhance their S&T Miner Experience. Visit the SSC at 198 Toomey Hall, contact us at success@mst.edu, or join us on social media [@sandtssc](https://twitter.com/sandtssc). To see the course offerings and times for SSC Tutoring, visit studentsuccess.mst.edu/tutoring/.

Student Veterans Resource Center

The Student Veterans Resource Center (SVRC) is the nexus of resources and support for student veterans at S&T. The SVRC provides student veterans with a "safe space" and a familiar atmosphere. The center's Veteran Consuls provide one-on-one consultations to guide students to various resources on campus, while its advisor provides students with VA health and benefits resources. Visit the SVRC at Harris Hall, Suite G10, and contact us at svrc@mst.edu.