

**PHYS 3201 (71287)**  
**Physical Mechanics**  
**Fall 2022 Syllabus**

**Catalog Course Description:**

This course covers topics of rigid body motion in three dimensions, moving coordinate frames, two body collisions, conservation laws, small oscillations, generalized coordinates, and LaGrange's and Hamilton's equations. Prerequisite: Physics 2401.

**Instructor:**

Dr. Jim Musser  
Physics 122  
[musserj@umsystem.edu](mailto:musserj@umsystem.edu)  
Office Hours to be set with input from students

**Class meetings:**

Tuesdays and Thursdays, 11:00 am – 12:15 pm in Physics 127

**Textbook:**

*Classical Mechanics*  
Taylor, John R.  
ISBN: 1-891389-22-X

**Grading:**

Regular Exams (3)	60%
Final Exam	15%
Homework	25%

**Course Objectives (Student Learning Outcomes):**

Students will be able to solve standard problems in Classical Mechanics from the topics listed in the course schedule.

Students will be able to apply standard classical mechanics techniques to solve problems not previously encountered.

## Schedule

### **Section I, August 23 – September 15**

Fundamentals (Chapter 1)  
Motion in gravitational, electric and magnetic fields (Chapter 2)  
Momentum and Angular Momentum (Chapter 3)  
Energy (Chapter 4)  
Oscillations (Chapter 5)

### **Exam I, September 15**

### **Section II, September 20 – October 27**

Calculus of variations and Lagrange's equations (Chapters 6-7)  
Two-body central forces (Chapters 8 and 14)  
Non-inertial reference frames (Chapter 9)

### **Exam II, October 27**

### **Section III, November 1 – December 8**

Rigid bodies (Chapter 10)  
Coupled oscillators and continuum mechanics (Chapters 11 and 16)  
Hamiltonian mechanics (Chapter 13)  
Special relativity (Chapter 15)

### **Exam III, December 8**

### **Final Exam:**

Wednesday, December 14  
10:00 am – 12:00 pm

### **Homework:**

Homework assignments will be posted in the Canvas course.

### **Participation:**

Attendance and participation are required at every class meeting. Occasionally, a student will be absent due to university activity, illness or emergency. It is the student's responsibility to inform the instructor of any absences, provide appropriate relevant documentation and make arrangements with the instructor regarding missed assignments. If possible, inform the instructor in advance.

## 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 Disability Services at (573) 341-6655, [sdsmst@mst.edu](mailto:sdsmst@mst.edu), visit <http://dss.mst.edu/> for information.

### Student Honor Code and Academic Integrity

- All students are expected to follow the [Honor Code](#).
- Page 30 of the Student Academic Regulations handbook 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 (<http://registrar.mst.edu/academicregs/index.html>), **any of which will be reported to the Vice Provost for Academic Support.**
- Other resources for students regarding academic integrity can be found [online](#).

### Well-Being and UCARE (<https://go.mst.edu/ucare-report>)

Any of us may experience strained relationships, increased anxiety, feeling down, alcohol/drug misuse, decreased motivation, challenges with housing and food insecurity, etc. When your mental well-being is negatively impacted, you may struggle academically and personally. If you feel overwhelmed or need support, please make use of S&T's confidential [mental health services](#) at no charge. If you are concerned about a friend or would like to consult with a Care Manager, please make a [UCARE referral](#) for support and assistance.

### Health and Well-Being Canvas Course.

(<https://umsystem.instructure.com/enroll/G3LY3G>)

The Health and Well-Being Canvas Course offers the Miner Well-Being Certification Program, a semester-long certification where participants can engage with campus-wide services and initiatives and develop skills that contribute to personal well-being and student success. Students can enroll in the free course at any time.

## **Nondiscrimination, Equity, and Title IX**

Missouri University of Science and Technology is committed to the safety and well-being of all members of its 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. Violations of this law include sexual harassment, sexual assault, dating/domestic violence, and stalking.

In accordance with The Collected Rules and Regulations University of Missouri, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Equity Officer, any notice of discrimination disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Missouri S&T's Equity Officer and Title IX Coordinator is Chief Diversity Officer Anitra Rivera. Contact their office at (573) 341-6038; 203 Centennial Hall) to report violations of the university's nondiscrimination policies, including Title IX. To learn more about resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit <http://titleix.mst.edu>.

## **Classroom Egress Maps**

For all in-person instruction, faculty should explain where the classroom emergency exits are located. Classroom egress maps are posted at

<http://designconstruction.mst.edu/floorplan/>.