

Physics 4343: Atomic Physics MoWeFr 2:00-2:50pm Rm 127 Fall '22

Instructor:

Dr. Daniel Fischer
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phone: (573) 308-2782
office: 110 Physics
lab: G10 Physics
office hours: by appointment

Office hours:

TuTh 1:00pm-3:00pm
(See if I'm around at other times)

Texts:

There is no course textbook. Parts of the course will use "Atoms, Molecules and Optical Physics" by I. Hertel and C. Schulz. Another AMO textbook used in the course is "Atoms, molecules and photons: an introduction to atomic-, molecular-, and quantum-physics" by W. Demtroeder. Supplemental material and references will be provided on CANVAS.

Description:

This course will be on methods and applications of modern atomic and molecular physics. An introduction into the structure and dynamics of atomic and simple molecular systems as well as into their interaction with light is given. The most fundamental theoretical models (non-relativistic quantum mechanics) as well as relevant approximations will be discussed. The course will also include selected topics in recent atomic physics such as atomic clocks, laser cooling, and precision spectroscopy.

Grading:

Course points:

3 hourly exams @ 150 pts	450 P
Comprehensive final exam	250 P
Homework (10 of 12)	300 P
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SUM	1000 P

Grades:

A	≥ 900 points
B	≥ 800 points
C	≥ 700 points
D	≥ 600 points
F	< 600 points

Homework:

One of the goals of this course is to develop your ability to solve basic problems in atomic molecular physics. Problem set will be assigned weekly on Wednesdays and will generally be due the Wednesday after class in the following week. I can assist in understanding the assignments during office hours. Your 10 highest scores will count towards your final grade. **Late homework will not be graded unless you contact me in advance to request and extension.**

Exam dates:

09/14/2022	Exam 1 (2pm-2:50pm)
10/12/2022	Exam 2 (2pm-2:50pm)
11/08/2022	Exam 3 (2pm-2:50pm)
12/14/2022	Final exam (2pm to 4pm)

Disability support service:

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 disability, please contact me and the Student Disability Services at (573) 341-6655, sdsmst@mst.edu, visit <http://dss.mst.edu/> for information, or go to mineraccess.mst.edu to initiate the accommodation process.

Academic dishonesty:

You should behave as responsible scholars and scientists. Academic dishonesty such as plagiarism, cheating, or sabotage is unethical and unacceptable. For more detail see the Student Academic Regulations which are available at <http://registrar.mst.edu/academicregs/index.html> and the Honor Code developed and endorsed by the Missouri S&T Student Council at <http://stuco.mst.edu/honor-code/>.

Title IX:

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. 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. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit <https://equity.mst.edu/>.

Emergency exits:

Please familiarize yourself with the classroom emergency exits shown on the egress maps posted on-line at: <http://designconstruction.mst.edu/floorplan/>

Complaints:

If there are any complaints that cannot be resolved they can be taken to the department chair Dr. Vojta (102 Physics, vojtat@mst.edu).