

20th Century Physics (Physics 202) Fall 2017

Professors:

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weekly hour long lab period is included in regular class hours.

Grading: Course grades will be assigned on an absolute scale according to

A-/A+	B-/B+	C-/C+
90-100%	80-90%	70-80%

D-/D+	F
60-70%	Below 60%

The components of your grade and their relative weights are:

Homework (35%) Daily homework will be graded as follows:

Complete (3 points)

- 3 = all parts present and fully developed
- 2 = some parts incomplete
- 1 = major sections missing
- 0 = little meaningful work done

Clear (2 points)

- 2 = model (i.e. physical reasoning) was clear to the grader
- 1 = some aspects were unclear
- 0 = model was completely opaque

Plausible (1 point): One point is awarded if the result's magnitude, sign, and/or units were plausible.

Initially OK (1 point): one point is awarded if the solution was acceptable on the first pass.

Correct (3 points)

- 3 = no modeling or algebraic errors
- 2 = some modest errors were made
- 1 = fundamental errors were made
- 0 = almost nothing was correct

Once students receive their graded papers back, they are allowed to submit corrections (in green or purple ink) on Wednesdays in the marked box in the physics main office. Students may earn additional points only for the "Clear" and

Shastri Fall 2017 Schedule					
Time	M	T	W	Th	F
8					
9			Dept mtng 9-10	Research	
10	Phys161 10-10:50	Phys305 9:30-10:20	Phys161 10-10:50		Phys161 10-10:50
11	Office	Office	Office		Office
12			Phys202 12-1:50		
1	Phys202 1-1:50				Phys202 1-1:50
2	Office		Office		Research
3	Phys305 3-4:50	Phys161L 3:30-4:45	Phys305 3-4:50	Phys161L 3:30-4:45	
4					
5					

Meetings: Lecture 1-1:50pm MF, HA305,
Lecture/Lab 12-1:50am W, HA305/323.

Final exam time: 11:30am, Monday, December 11, 2017. You must plan to take the final exam on this day. Travel plans, etc. will not be grounds for a makeup exam.

Prerequisite: Physics 200, 201

Link to course web page:

<http://physics.mnstate.edu/courses.cfm>

Required texts:

- *Physics 202 lab manual*, online.
- *Six Ideas That Shaped Physics, Unit Q 2nd Edition*, Thomas Moore
- *Six Ideas That Shaped Physics, Unit T 2nd Edition*, Thomas Moore

Description: Physics 202 is Introduction to physics topics in 20th century physics: thermodynamics, physical optics, and overview of atomic, molecular, and particle physics. A

"Correct" categories: the scores for all other categories remain fixed at their initial values. This implies that students may earn a maximum of 9 points on a complete and plausible but incorrect initial effort after appropriate correction. **Students are allowed to resubmit no more than 4 problems per week for makeup.**

Weekly homework may involve the use of a problem-solving sheet, with a rubric to be described in class.

Labs (15%) the lab reading will be either handed out in class or posted on the web prior to lab. **You must read the lab material before lab and answer the prelab questions. These will be due before the lab.** For most labs, you will write a report according to the guidelines given in class and posted online. You will hand in the lab report the week after lab.

Quizzes (10%) will be worth ten points and graded for conceptual understanding of physics and mathematical correctness.

Exams (35%) You will have 3 fifty minute exams and one two-hour final. See the attached schedule for dates.

On-time attendance (5%) You must be *on time* for class (defined as the period before I start talking) and sign in.

Policies:

1. *No late assignments:* Assignments are due on the date specified. Assignments not submitted at that time are considered late. Late assignments will not be accepted. If you miss class due to illness, emergencies, military service, and participation in a university-related event. (see student handbook online at <http://www.mnstate.edu/sthandbook/>) you will need to obtain written proof. Fill out the late assignment form obtainable from the course website. Submit the form, proof, and assignment to your lab instructor (in the case of lab reports, homework) or lecturer (in the

case of exams). If your request is valid, you will be contacted regarding the makeup.

2. *Be on time:* An attendance sheet will be available at the beginning of class. You must sign in at the beginning of class, or you will lose all the attendance points for that day.
3. *Class attendance is expected:* Absences are excused in cases of illness, emergencies, military service, and participation in a university-related event. (see student handbook online at <http://www.mnstate.edu/sthandbook/>).
4. *No food or drinks in lab:* This class will make use of sensitive equipment. So as to keep it working for many years to come, we ask you cooperation in not bringing food or drinks into the lab area. Please use the lounge areas.
5. *Cheating:* Copying someone else's homework with or without their consent, copying another person's lab report and submitting as your own, copying problem solutions from another person's exam are all forms of cheating. This behavior will earn an F for the assignment and possibly an F for the course. The final decision will be made by the lab instructor and lecturer.

Minnesota State University Moorhead is committed to providing equitable access to learning opportunities for all students and strives to make courses inclusive and accessible in accordance with sections 504 and 508 of the 1973 Rehabilitation Act and the Americans with Disabilities Act. The University will make reasonable accommodations for students with documented disabilities. Accessibility Resources (AR) is the campus office that collaborates with students in need of special accommodations to assist in providing and/or arranging reasonable accommodations. If you have, or think you may have, a disability (e.g. mental health, attentional, learning, chronic health, sensory or physical):

- Please contact Accessibility Resources at (218) 477-4318 (V) or (800) 627.3529 (MRS/TTY) to schedule an appointment for an intake. Online

students may need to schedule a phone meeting or web conference.

- If you are already registered with Accessibility Resources and have a current Accommodation Letter, please schedule an appointment to visit with

me, during my office hours, to discuss implementation of your accommodations.

Additional information is available on the AR website: <http://www.mnstate.edu/disability/>

Tentative schedule for Fall 2017

Week	Mon	Tues	Wed	Thurs	Fri	Lecture
1 (Aug. 21-25)	E15		E15		Q1	<ul style="list-style-type: none"> • Traveling waves • Wave equation • Standing waves
2 (Aug. 28-Sept. 1)	Q2		Lab1		Q2	<ul style="list-style-type: none"> • Light diffraction •
3 (Sept. 4-8)	No class		Quiz1 Q3		Q4	<ul style="list-style-type: none"> • Optical resolution • Photoelectric effect • De Broglie wavelength
4 (Sept. 11-15)	Q4		Lab2		Q5	<ul style="list-style-type: none"> • Electron diffraction • Complex numbers
5 (Sept. 18-22)	Exam1		Q5,6		Q5	<ul style="list-style-type: none"> • Wavefunctions • Probability • Rules of QM
6 (Sept. 25-29)	Q6		Lab3		Q7	<ul style="list-style-type: none"> • Collapse of wavefunction • Particle in a box
7 (Oct. 2-6)	Q7		Quiz2 Q8,9		Q8	<ul style="list-style-type: none"> • Harmonic oscillator • Bohr model • Hydrogen atom • Spin
8 (Oct. 9-13)	Q10		Lab4		Q10	<ul style="list-style-type: none"> • Schroedinger equation •
9 (Oct. 16-20)	Q10		Q11		Q14	<ul style="list-style-type: none"> • Energy eigenfunctions • Radioactivity
10 (Oct. 23-27)	Exam2		T1		T2	<ul style="list-style-type: none"> • Temperature • Ideal gas
11 (Oct. 30- Nov 3)	T3		Lab5		T3	<ul style="list-style-type: none"> • PV diagrams • Work done by /on a gas • Thermodynamic processes
12 (Nov. 6-10)	T4		T5 Quiz3		No class	<ul style="list-style-type: none"> • Microstates, macrostates • 2nd Law of thermodynamics • Irreversibility and entropy
13 (Nov. 13-17)	T5		Lab6		T6	<ul style="list-style-type: none"> • Boltzmann factor • Average energy of a system • dS
14 (Nov. 20-24)	Exam3		No class	No class	No class	
15 (Nov. 27-Dec. 1)	T8		T8,9		T9	<ul style="list-style-type: none"> • Entropy changes for various processes • Heat engines • Refrigerators
16 (Dec. 4-8)	T9		Study day		.	
17 (Dec. 11-15)	Final					Final 11:30 am Monday, Dec. 11