Course Title/Number	**Physical Chemistry I / CHM 357**
Semester/Year	Fall 2016
Days/Time	MWF 11:00-11:50 AM; M 12:00-1:50 (lab)
Location	470 Science Hall
Instructor	Dr. Laura McCunn-Jordan ******PLEASE CALL ME DR.MCCUNN***
Office	466 Science Hall; research lab: 404 Science Hall
Phone	(304) 696-2319
E-Mail	mccunn@marshall.edu
Office/Hours	Mon. 3:00-4:00, Wed. 1:30-4:30, Thurs. 9:00-11:00, or by appointment. I welcome drop-in visits, but I am not always available outside of office hours. Simple questions can be answered via email.
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description:

A systematic study of physical chemistry. 4 credit hours (Prerequisites: C or better in all of the following: CHM 212, PHY 211, and MTH 230 or consent of instructor)

Student Learning Outcomes	**How students will practice each outcome in this course**	**How student achievement of each outcome will be assessed in this course**
Students will understand the limitations of classical mechanics.	• lectures and readings • weekly recitations • homework	• tests and quizzes
Students will understand the requirements of wavefunctions to satisfy the Schrodinger equation and the Heisenberg Uncertainty Principle.	• lectures and readings • weekly recitations • homework	• tests and quizzes
Students will apply calculus to solve the Schrodinger equation.	• lectures and readings • weekly recitations • homework	• tests and quizzes
Students will apply principles of quantum mechanics to understand spectroscopy and chemical bonding.	• lectures and readings • weekly recitations • homework	• tests and quizzes

Students will understand, interpret and discuss scientific literature.	• journal clubs	• students will lead journal club sessions at the end of the course
Students will enhance writing skills and strategies.	• low-stakes short essays in homeworks, quizzes, and journal clubs • peer-editing of lab reports • editing conferences with Dr. McCunn	• graded lab reports • lab notebook • tests and quizzes • student-led journal club
Students will refine oral communication skills.	• journal clubs • weekly recitations	• student-led journal club

Required Texts, Additional Reading, and Other Materials

1. *Physical Chemistry: Thermodynamics, Structure, and Change, 10th Edition* by Atkins and de Paula (Either the full textbook or Volume 2 will suffice.)
2. *Applied Mathematics for Physical Chemistry, 3rd Edition* by Barrante (recommended)
3. composition notebook (not spiral-bound) for lab (reusing an old notebook is permitted)
4. indirectly vented chemical safety goggles for lab
5. calculator (graphing calculators are permitted)
6. Access to ACS academic lab safety guide (online) https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/safety-in-academic-chemistry-laboratories-students.pdf

Grading Policy

The following list shows planned course assignments and their relative values. In the case of emergency class cancellations, the instructor may cancel one or more assignments (excluding tests), reducing the number of available points.

homework/quizzes	200 points
tests	300 points
journal clubs	100 points
lab reports	150 points
lab notebook	50 points
final exam	200 points
	1000 TOTAL POINTS

Grading Scale

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Grades are rounded to the nearest whole percent.

Each student may submit up to two written assignments late without penalty. Late assignments must be submitted at the next class meeting, unless prior arrangements are made with the instructor. The final grading scale may be adjusted in order to lower the score required for a particular letter grade. Any changes will work in the students' favor.

Writing-Across-the-Curriculum Designation

This course has been designated "WI," or writing-intensive. Throughout the course, students will develop the ability to comprehend the concepts of physical chemistry and interpret them for others through written communication. The following course activities are examples of how students will develop their writing skills this semester.

homeworks- each will include at least one qualitative, short-response question
tests- ~20% of test content will require written responses (without calculations)
lab notebook- standards of industry and academe will be reinforced
journal club- written responses to research literature
lab reports- written in the style of research manuscripts
oral presentations- slides will be written to effectively complement the presentations

Attendance Policy

Class attendance is not required, but highly recommended. If you are absent, please contact Dr. McCunn ASAP to request missed assignments. In the case that class is cancelled due to inclement weather or an emergency on the day of a scheduled test, the test will be given in the next scheduled class period.

Lab Policies

Students must complete lab safety training (tentatively scheduled at MU Online). Goggles are required during any designated lab time. Clothing must cover the entire torso and extend down past the knees. Shoes must cover the entire foot. Disregard for safety in the lab may result in a failing grade for a lab or removal from the class.

Miscellaneous Policies

Please silence cell phone ringers during class or exams. Dr. McCunn reserves the right to answer any ringing cell phones during class, dismiss the offending student, or deduct points from the student's final grade. Use of cell phones / PDAs / MP3 players and similar devices during tests and exams will be considered as cheating. The only materials permitted during a test are a calculator, pen/pencil, and those provided by the instructor. Class announcements may occasionally be made via email to your university email address. Please check it on a regular basis.

Approximate Course Schedule

Week of	Chapter / Topic		Lab
8/22	7	Quantum Theory	Calculus Review
8/29	7, 8A	Quantum Theory, Translational Energy	Particle in a Box
9/5	no class on 9/5; 8A	Translational Energy	no lab
9/12	8B	Vibrational Energy	Journal Club
9/19	8C	Rotational Energy	Computational Chemistry
9/26	9A&B	Hydrogen Atom, Multielectron Atoms	review session
10/3	9C	Term Symbols and Atomic Spectra	TEST 1
10/10	10	Valence Bond and MO Theory	Journal Club
10/17	10, 11	Bonding and Symmetry	Absorption Spectra
10/24	11, 12	Symmetry and Spectroscopy	Computational Chemistry
10/28 is the last day to drop a full semester course			
10/31	12	Rovibrational Spectroscopy	HCl and DCl
11/7	13A	Electronic Spectroscopy	HCl and DCl
11/14	13B, TEST 2 on 11/18	Electronic Spectroscopy	Journal Club
11/21	no class—Fall break		
11/28	14	NMR and EPR	EPR
12/5	journal club presentations, dead week begins 12/5		review session
12/13, Tuesday, 10:15 AM FINAL EXAM			