

**Student Syllabus for Chemistry 336**  
**Physical Chemistry II**  
**Spring 2022**

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**Lecture:** Tue., Thurs., Fri.      9:00-9:50 AM      **Location:** CBB 265

**Text:**      **Required:** Atkins and de Paula, “**Physical Chemistry: Thermodynamics, Structure, and Change**”, 10<sup>th</sup> ed.

- *ISBN-13: 978-1429290197*
- *ISBN-10: 1429290196*
- This is available for rental at the University Bookstore

**Suggested:** McQuarrie, “**Mathematics for Physical Chemistry: Opening Doors**” University Science Books.

Scientific calculator (required)

**Office hours:**      Mon. 2:00-3:00 PM  
                              Tues. 4:00-5:00  
                              Thurs. 10:00AM-11:00 PM  
                              By appointment

## **COURSE DESCRIPTIONS (CHEM 336: Physical Chemistry II)**

### **Description:**

3 credits (Three hours of lecture per week.

- PHYSICAL CHEMISTRY Continuation of Chemistry 335. Laws and principles of physical chemistry including atomic and molecular structure, atomic and molecular spectroscopy.

### **Prerequisites:**

CHEM 335 (Chemistry 248 and 326; Mathematics 222; Physics 250).

## **COURSE OBJECTIVES**

### **Course Learning Outcomes**

Students completing Chemistry 336 will be able to:

- (a) Explain the historical development of quantum mechanics
- (b) Apply quantum mechanics to exactly solvable systems and use those solutions to understand chemical systems.
- (c) Apply quantum mechanics to chemical systems that are not exactly solvable by using various approximation methods
- (d) Use group theory and symmetry to explain the electronic structure of simple molecules, assign vibrations of polyatomic molecules, and explain spectroscopic selection rules.
- (e) Analyze spectra of molecules using quantum mechanical models and obtain molecular constants from those analyses.

## **Living and Learning During COVID-19.**

### **Face Coverings:**

- At all UW-Stevens Point campus locations, the wearing of face coverings is mandatory in all buildings, including classrooms, laboratories, studios, and other instructional spaces. Any student with a condition that impacts their use of a face covering should contact the [Disability and Assistive Technology Center](#) to discuss accommodations in classes. Please note that unless everyone is wearing a face covering, in-person classes cannot take place. This is university policy and not up to the discretion of individual instructors. Failure to adhere to this requirement could result in formal withdrawal from the course.

### **Other Guidance:**

- Please monitor your own health each day using [this screening tool](#). If you are not feeling well or believe you have been exposed to COVID-19, do not come to class; email your instructor and contact Student Health Service (715-346-4646).
  - As with any type of absence, students are expected to communicate their need to be absent and complete the course requirements as outlined in the syllabus.
- Maintain a minimum of 6 feet of physical distance from others whenever possible.
- Do not congregate in groups before or after class; stagger your arrival and departure from the classroom, lab, or meeting room.
- Wash your hands or use appropriate hand sanitizer regularly and avoid touching your face.
- Please maintain these same healthy practices outside the classroom.

**METHODOLOGY:** The class is composed of three lectures per week. The lecture itself will primarily be lecture-based, although students may be asked to break up into groups to work on problems daily. These problems will not be due, but it is expected that every student will pair up into a group and complete the assigned problems.

**Attendance:** Attendance for all lectures, discussions and laboratories is expected as outlined in the UWSP Undergraduate Catalog. See the section about Attendance under Academic Policies. Due to the difficult nature and fast pace of this course, attendance is mandatory. Because of the small class size, I will not officially take attendance, as any absence will be easily spotted. If you must miss a class due to unavoidable circumstances, make sure to get lecture notes from a classmate—you will be held responsible for any missed material. Absences will be factored into your final grade in cases of borderline scores.

**Canvas:** Course information (homework and exam solution sets, course grades, other course material) will be posted daily on Canvas. It is your responsibility to visit the site daily. You can log into Canvas at: <https://www.uwsp.edu/canvas/Pages/default.aspx>

**Exams:** There will be three hourly exams will be given on Thursday, February 24, Friday, Friday, April 8, and Thursday, May 5. **The cumulative final is on Wednesday, May 18 in Chemistry Biology Building 265, 12:30PM-2:30PM.**

**Homework:** Mandatory homework is assigned for each chapter and is due approximately one week after it is assigned. There are a total of 6 assignments for a total of 300 points. The assignment and due dates are given in the course outline section of the syllabus. It is essential to do the homework in order to succeed in this class. Exams are heavily based on homework. You may work together on the homework, but each student is responsible for understanding each problem. Copying another's homework is not "group work" - it is plagiarism. If asked, you are responsible for justifying that your work is your own. I will not credit anything that I perceive to be copied work.

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**Make-up policy:** There will be **NO** unexcused make-ups of homework or exams. Any excused makeups must be performed within 48 hours of the original date.

**Final Exam:** Note that the final exam is cumulative, covering Ch. 7-10; 12-13. It is scheduled for Wednesday, 5/18, 12:30-2:30 PM in Chemistry Biology Building 265.

**Grading:** Your final grade will be based on the following point system:

Hourly exams:	3 × 150 points	=	450 points	(45%)
Final exam:	1 × 250 points	=	250 points	(25%)
Homework:	6 × 50 points	=	300 points	(30%)
Total:	450+250+300 points	=	1000 points	(100%)

You will be graded on the following scale:

% Total Points	Grade	% Total Points	Grade
≥ 90 %	A	≥ 63%	C
≥ 88%	A-	≥ 61%	C-
≥ 86%	B+	≥ 59%	D+
≥ 77%	B	≥ 50%	D
≥ 75 %	B-	< 50 %	F
≥ 73%	C+		

### **Study Tips for Physical Chemistry.**

- Lectures will primarily follow the text. Read the assigned sections before lecture and again shortly after, using your lecture notes as a supplement. Repeating the information helps the facts and concepts sink and remain in your brain.
- Try to work problems from the text as soon as possible after lecture. This will help you discern where your understanding may be lacking and will help reiterate the important concepts.
- I cannot overemphasize the importance of peer groups!! Form a group of students from class and plan to meet outside of class at least once a week to discuss problems and material. Your peers may have picked up on something in lecture that you missed, they may be able to explain something in terms that you will understand better than I may be able to do, and you will be reviewing the material which will again help you to remember it come test time.
- This course covers some difficult material and necessarily maintains a rapid pace. Expect to spend at least 12 hours per week outside class for study, and homework. If you cannot commit to this level of study, I recommend you reduce your other commitments or withdraw from the course.
- Do the homework, re-do the homework, and do practice problems. "Practice makes perfect."

### **Academic Honesty/Plagiarism Policy:**

You are encouraged to study together, work problems and exercises with others in the class, and to seek help in understanding the material. However, unless specifically instructed otherwise, all work to be graded should be your own work, and not copied from any other person. Any instances of plagiarism or cheating will be dealt with in accordance with the UWSP Chapter 14 rules on Academic Misconduct. Any

violations will result in a zero for that assignment/exam. A second violation results in an F for a final grade in the class.

### **Accommodation of Persons with Disabilities:**

The Americans with Disabilities Act (ADA) is a federal law requiring educational institutions to provide reasonable accommodations for students with disabilities. If you have a disability and require classroom or exam accommodation, please register with the Disabilities Services office and then contact me within the first two weeks of the semester. In order to receive accommodations, you must have documentation of your disability on file with the Office of Disability Services. In addition, you must provide me with an Accommodations Request Form (available on their website). You must have me sign the form and return it to the Office of Disability Services.

### **University Policy on Absence to Observe Religious Holidays**

It is UW System policy to reasonably accommodate your sincerely held religious beliefs with respect to all exams and other academic requirements. You will be permitted to make up an exam or other academic requirement at another time or by an alternative method, without any prejudicial effect, if:

- There is a scheduling conflict between your sincerely held religious beliefs and taking the exam or meeting the academic requirements; and
- You have notified me within the first three weeks of the beginning of classes of the specific days or dates that you will request relief from an examination or academic requirement.
- I will accept the sincerity of your religious beliefs at face value and keep your request confidential.
- I will schedule a make-up exam or requirement before or after the regularly scheduled exam or requirement.
- You may file any complaints regarding compliance with this policy in the Equity and Affirmative Action Office.

**Tentative Course Outline**  
**(Subject to change)**

<b>Week</b>	<b>Day</b>	<b>Date</b>	<b>Lecture</b>	<b>Due</b>
<b>1</b>	T	25-Jan	Introductions/§7A.1	----
	Th	27-Jan	§7A.1-§7A.2	----
	F	28-Jan	§7B.1-§7B.2	----
<b>2</b>	T	1-Feb	§7B.3-§7C.1	----
	Th	3- Feb	§7C.1-§7C.2	----
	F	4- Feb	§7C.3-§7C.4	----
<b>3</b>	T	8-Feb	§8A.1-§8A.2	HW #1
	Th	10-Feb	§8A.3-§8A.4	----
	Fr	11-Feb	§8B.1-§8B.2	----
<b>4</b>	T	15-Feb	§8B.2-§8C.2	----
	Th	17-Feb	§8C.2	----
	F	18-Feb	§9A.1	HW #2
<b>5</b>	T	22-Feb	§9A.2	----
	Th	24-Feb	<b>Exam 1 Ch. 7-8</b>	----
	F	25-Feb	§9B.1	----
<b>6</b>	T	1-Mar	§9B.1-§9B.2	----
	Th	3- Mar	§9B.2-§9B.3	----
	F	4- Mar	§9C.1-§9C.2	----
<b>7</b>	T	8-Mar	§9C.2	----
	Th	10-Mar	§10A.1-§10A.2	HW #3
	F	11-Mar	§10A.2-§10B.1	----
<b>8</b>	T	15-Mar	§10B.2-§10C.1	----
	Th	17-Mar	§10C.1-§10C.2	----
	F	18-Mar	§10D.1-§10D.2	----
<b>x</b>	T	22-Mar	<b>Spring Break—No Class</b>	----
	Th	24-Mar		
	F	25-Mar		
<b>9</b>	T	29-Mar	§10D.2-§10E.1	----
	Th	31-Mar	[§10E.2-§10E.3]	----
	F	1-Apr	[§10E.3]	----
<b>10</b>	T	5- Apr	§12A.1	HW #4
	Th	7-Apr	§12B.1	----
	F	8-Apr	<b>Exam 2 Ch. 9-10</b>	----
<b>11</b>	T	12-Apr	§12B.2	----
	Th	14-Apr	§12C.1	----
	F	15-Apr	§12C.2	----
<b>12</b>	T	19-Apr	§12C.3-§12D.1	----
	Th	21-Apr	§12D.2-§12D.3	----
	F	22-Apr	§12D.4-§12D.5	----
<b>13</b>	T	26-Apr	§12E.1-§12E.2	----
	Th	28-Apr	§12E.2-§12E.3	----
	F	29-Apr	§12E.3-§12E.4	----
<b>14</b>	T	3-May	§13A.1	HW #5
	Th	5-May	<b>Exam 3 Ch. 12</b>	----
	F	6-May	§13A.1-13A.2	----
<b>15</b>	T	10-May	§13A.2	----
	Th	12-May	§13B.1	----
	F	13-May	§13B.2	HW #6
<b>x</b>	W	18-May	<b>FINAL EXAM</b>	

Please note, the last day to drop without a grade is Wed., Feb. 2, and the last day to drop with a “W” is Fri., Apr. 8.

### **Important Dates**

<b>Date</b>		<b>Event</b>
W	2-Feb	Last day to drop without a grade
Th	24-Feb	Exam #1 (Ch. 7-8)
T	21-25-Mar	Spring Break
F	8-Apr	Exam #2 (Ch. 9-10)
F	8-Apr	Last day to drop course
Th	5-May	Exam 3 (Ch. 12)
W	18-May	Cumulative Final Exam

### **Homework Due Dates**

<b>Due Date</b>		<b>Homework</b>	<b>Chapter</b>
Tue	2/8	1	7
Fri	2/18	2	8
Thurs	3/10	3	9
Tue	4/5	4	10
Tue	5/3	5	12
Fri	5/13	6	13

### **Exam Dates**

<b>Date</b>		<b>Exam</b>
Thurs	2/24	Exam 1 (Ch. 7-8)
Fri	4/8	Exam 2 (Ch. 9-10)
Thurs	5/5	Exam 3 (Ch. 12)
Wed	5/18	Cumulative Final Exam