



## **Chemistry 563 – Physical Chemistry Laboratory (1 cr)**

### **Online Course Website**

The specific course website for each section can be accessed through the general canvas dashboard located at <https://canvas.wisc.edu>

### **Course Designations**

Breadth - Physical Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

### **Meeting Times**

All sections meet from 1:20-5:20p in room B200 on days specified below:

Chem 563-001: Mondays

Chem 563-003: Tuesdays

Chem 563-004: Wednesdays

Chem 563-006: Thursdays

### **Instructional Mode**

The course is instructed with all sessions being face-to-face.

### **Credit Hour Completion**

The course follows the “45 hours per credit” definition where one credit is at least 45 hours of work throughout the semester. The total in-class time throughout the semester is 38 hours and the out-of-class participation is expected to be at least 7 hours, but likely to be approximately 20 hours.

## **Instructors and Teaching Assistants**

Prof. Etienne Garand (egarand@wisc.edu) – Instructor for Chem 563-001 and Chem 563-004

Dr. Mark Wendt (mark.wendt@wisc.edu) – Instructor for Chem 563-003 and Chem 563-006

Paul Zaziski (przaziski@wisc.edu) – Faculty assistant for all sections

Office hours for all sections are from 12:15-1:15p Monday through Thursday

## **Course Description**

Principles of experimental physical chemistry applied to the acquisition of thermodynamic and kinetic data; use of basic physical laboratory equipment; related computations, analysis of errors, interpretation of results.

## **Requisites**

CHEM 561 or 565 or CBE 310

## **Textbook**

There is no textbook required for the course. Required reading material is provided by hard copies of handouts, and also provided electronically on the course website. Suggested readings are provided electronically on the course website.

## **Course Learning Outcomes**

Understand the quality and information content of experimental measurements.

Emulate the process by which new knowledge is generated.

Communicate scientific content in oral conversation.

Make connections between the physical chemistry laboratory experience and other courses.

## **Safety**

Eye protection (goggles, or safety glasses that include side protection) and closed-toe shoes are always required in the laboratory whenever any experiments are in progress. Goggles are available in the lab for student use, but you are encouraged to use your own. Other clothing choices are up to you but be aware that there are always dangers of stains, corrosive chemical spills, splashes, and broken glass when working in a chemistry laboratory.

## Graded Materials

- *Online quizzes*: There are three prelab quizzes worth 10 points each. These quizzes are due before the laboratory period on the assigned day. Your final score for each quiz is the highest score out of a maximum of three attempts.
- *Oral exams*: There are two oral exams worth 50 points each. You should be prepared to discuss the theory behind the experiment as well as specifics of your data and methods. Specific topics, details of the format, and the schedule will be discussed before the exam.
- *Written activities*: Most laboratory periods have a set of written activities that are to be submitted at the end of the period. There are a total of nine sets of these activities worth 150 points combined.
- *Evaluations*: There is a 10 point evaluation score for each of the first three days associated with each experiment (60 points total). This score is affected primarily by lab preparation, participation, hygiene, and timeliness.
- *Postlab discussions*: There is a 30 point evaluation score for each postlab discussion. This score is based on your presentation as well as participation during presentations by others.

## Point Breakdown

Online quizzes (3)	= 30 pts
Oral exams (2)	= 100 pts
Postlab discussions (2)	= 60 pts
Written assignments (9)	= 150 pts
Evaluations (6)	= 60 pts

*Total = 400 pts*

Final grades are intended to be assigned using the scale below.

<i>A</i>	360+
<i>AB</i>	344-359
<i>B</i>	320-343
<i>BC</i>	304-319
<i>C</i>	272-303
<i>D</i>	232-271
<i>F</i>	<232

## Schedule

(★ = online individual submission, ⊕ = hard copy individual submission, ☆ = hard copy group submission)

Day	Topic	Before Lab	During Lab	End of Lab
1/29	Numerical Treatment of Experimental Data	⇒ Read handout ⇒ Watch Excel primer videos ★ Take quiz	⇒ Introductions ⇒ Review of syllabus ⇒ TA discussion ⇒ Work on activities	⊕ Submit activities
2/5	Conductance	⇒ Read handout ⇒ Watch video ★ Take quiz	⇒ TA discussion ⇒ Work on day 1 activities	☆ Submit day 1 activities
2/12	Conductance	⇒ Read day 2 activities	⇒ Work on day 2 activities	☆ Submit day 2 activities
2/19	Conductance	⇒ Read day 3 activities	⇒ Work on day 3 activities	☆ Submit day 3 activities
2/26	Conductance	⇒ Read day 4 activities	⇒ Write up results on boards ⇒ Present results to class ⇒ Discuss concepts	☆ Submit day 4 activities
3/5	Conductance	⇒ Prepare for oral exam	⇒ <b>Oral exam</b>	
3/12	Kinetics	⇒ Read handout ★ Take quiz	⇒ TA discussion ⇒ Work on day 1 activities	☆ Submit day 1 activities
3/19	Kinetics	⇒ Read day 2 activities	⇒ Work on day 2 activities	☆ Submit day 2 activities
3/26	<i>No Lab</i>			
4/2	Kinetics	⇒ Read day 3 activities	⇒ Work on day 3 activities	☆ Submit day 3 activities
4/9	Kinetics	⇒ Read day 4 activities	⇒ Write up results on boards ⇒ Present results to class ⇒ Discuss concepts	☆ Submit day 4 activities
4/16	Kinetics	⇒ Prepare for oral exam	⇒ <b>Oral exam</b>	