

## SYLLABUS

**Course:** **Chemistry 3025L:** Physical Chemistry I – Thermodynamics and Kinetics Laboratory

Lab Section 1: Thursday 8:00 – 11:30 AM in Sator Hall room 208

Lab Section 2: Thursday 1:30 – 5:00 PM in Sator Hall room 208

**Instructor:** Dr. Ken Martin  
Office location: Chemistry Suite Rohr Science room \_\_\_\_\_  
Office hours: TBD  
Phone: 619-208-6977  
Email: [kmartin@pointloma.edu](mailto:kmartin@pointloma.edu)  
(I will be able to answer emails sent between 8 AM and 6 PM).

**Required Materials:** *Scientific or Graphing Calculator and access to a computer with Excel software*  
*COVID appropriate PPE's*  
*Laboratory safety glasses and lab coat: sold in lab.*  
All laboratory experiment protocols will be distributed as on-line “handouts”.  
There are no text materials required for this course beyond those purchased for CHE3025.

**Course Description:** CHE3025L (1 unit) An inquiry-based laboratory that is a co-requisite for CHE 3025. Letter graded.

**Learning Outcomes:** Upon completing this course you will:

1. Have improved your understanding of the laws of thermodynamics, as well as concepts including energy, and enthalpy. You will develop skills in using these concepts to predict the outcomes of physical processes and chemical reactions.
2. Have improved your understanding of chemical kinetics theory, and how to measure the rates of reactions.
3. Have a clearer understanding of safety measures used when working with potentially dangerous laboratory procedures.
4. Have acquired some of the necessary skills that will be useful for future work in science or science-related fields. These skills include: problem solving, the collection, analysis, and usage of data, using computer software, and the articulation and presentation of experimental and theoretical results in written and oral form.

CHEM PLO 2 (UV-vis) and BCHM PLO 3 (UV-vis) will be assessed directly by faculty laboratory instructors' observation of students' use of this instrument.

- Prelab Exercises:** A prelab exercise will be assigned at the beginning of each new lab. These are designed to enhance understanding of the particular experiment about to be performed.
- Lab Reports and Presentations:** There will be six experiments in total, one approximately every two weeks. Each experiment will have a due date at which time you will submit your work from the lab, which may include calculations, figures, a lab report, or an oral presentation. More details about these assignments will be described in the lab rubrics and individual experiment handouts.
- Participation:** Discussions and collaboration with your fellow student “colleagues” will be encouraged in all laboratory work. Each student will be assigned to a group of two or three students. The students in each group will work together on all experimental work and collaborate on preparing lab reports when instructed to do so. Your colleagues may be asked to comment on your participation in the work of the group.
- Attendance:** Regular and punctual attendance to each assigned lab time is essential. The actual time used to do the experiment will be a bit more flexible than usual. Before each new experiment, the instructor will distribute a sign-up sheet for each group to pick a time to perform the lab. Everyone should plan to attend the required Zoom meeting, with cameras on, during the scheduled lab time to be briefed on the nature of the current experiment. After that, since equipment is scarce, you will take turns using equipment.

<b>Grading:</b>	Lab Reports/Presentations	85%
	Pre-Lab Exercises	10%
	Participation	5%

#### Approximate Grading Scale

A	93%	C	73%
A-	90%	C-	70%
B+	87%	D+	67%
B	83%	D	63%
B-	80%	D-	60%
C+	77%	F	< 60%

#### Tentative Lab Schedule

<u>Week #</u>	<u>Experiment</u>
1,2	1: Van der Waals Isotherms Computational Experiment
3, 4	2: The Joule-Thomson Coefficient
5, 6, 7	3: Bomb Calorimetry: Heat of Formation
8, 9, 10	4: Gas Phase Reaction: Dissociation of N <sub>2</sub> O <sub>4</sub>
11,12,13	5: Heat Capacity Ratio of Gases
14,15,16	6: Reaction Kinetics: The Bromination of Acetone

**To teach ~ To shape ~ To send****PLNU Mission:**

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

**Course Credit & Hour Information:**

In the interest of providing sufficient time to accomplish the state Course Learning Outcomes, this class meets the PLNU credit hour policy for a 1 unit class delivered over 15 weeks of instruction. Specific details about how the class meets the credit hour requirement can be provided upon request.

**PLNU copyright policy:**

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

**PLNU Academic Honesty Policy:**

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

**PLNU Academic Accommodations Policy:**

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. ([DRC@pointloma.edu](mailto:DRC@pointloma.edu) or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.