

SYLLABUS

Course: **Chemistry 3027:** Physical Chemistry II – Quantum Chemistry and Molecular Spectroscopy Laboratory

Lab Section 1: Tuesday 1:30 – 5:00 PM 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 213
Office hours: TBD
Cell Phone: 619-208-6977
Email: kmartin@pointloma.edu
(I will be able to answer emails sent between 8 AM and 6 PM).

Required Materials: *Scientific calculator and a computer capable of running Excel and other useful software.*
PPE-masks are required per University policy
Laboratory safety glasses and lab coat: sold in lab.
All laboratory experiments will be distributed as handouts. There are no text materials required for this course beyond those purchased for CHE3026.

Course Description: CHE 3027 (1 unit) An inquiry-based laboratory that is a co-requisite for CHE 3026. Letter graded.

Learning Outcomes: Upon completing this course you will:

1. Have improved your understanding of the theories and applications of quantum chemistry as they relate to molecular structure and spectroscopy.
2. Have improved your understanding of the utility of spectroscopy in revealing the nature and properties of molecular systems.
3. Have a clearer understanding of safety measures used when performing potentially dangerous laboratory procedures.
4. Have acquired the necessary skills useful for future work in science or science-related fields. These skills include: problem solving, the collection, and analysis 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) will be assessed directly by faculty laboratory instructors' observation of students' use of instruments.

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. These will be graded for completeness and accuracy.

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 lab report, which along with the prose may include calculations, figures, tables, and graphs. Some lab reports may involve an oral presentation. The format of the lab reports may vary. More details about these assignments will be described in lab rubrics and handouts.

Participation: Discussions and collaboration with your fellow student is encouraged in all laboratory work. You will be assign a lab partner. You and your lab partner will work together on all experimental procedures and collaborate on preparing lab reports when instructed to do so.

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 in other courses. Before each new experiment, I will distribute a sign-up sheet for each group to pick a time to perform the lab. Everyone should plan to attend any required Zoom meeting. These will be conducted during the scheduled lab time, and used to introduce the current experiment. After that, since the lab equipment is limited, you will take turns doing the experiment on a TBD schedule.

Grading:

Lab Reports/Presentations	85%
Pre-Lab Exercises	10%
Participation	5%

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, 3	1: The Photoelectric Effect
4, 5, 6	2: Conjugated Dyes-A Particle in a Box Model
7, 8	3: Computer Modeling of Spectroscopic Properties
9, 10	4: Computational Chemistry
11, 12	5: Rotational-Vibrational Spectra of HCl and DCl
13, 14, 15	6: Fluorescence Studies of a Molecular System

PLNU Mission	<p>To teach ~ to shape ~ to send</p> <p>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.</p>
Course Credit Hour Information	<p>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. Specific details about how the class meets the credit hour requirement can be provided upon request.</p>
PLNU copyright policy	<p>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.</p>
PLNU Academic Honesty Policy	<p>Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic <u>dishonesty</u> 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.</p>
PLNU Academic Accommodations policy	<p>PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.</p> <p>PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.</p> <p>Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.</p>