Name: Dr. Brian Barngrover  
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Office: M-124  
Office Hours: MWF 9 – 11 am, M 1:30 – 2:30 pm; other times by appointment  
Text and Materials:  
Physical Chemistry, by Silbey, Alberty, and Bawendi, 4th edition (required)  
CRC Handbook of Chemistry and Physics (optional)  
Calculator  

**COURSE CALENDAR:** ON SEPARATE PAGE  

**GRADING POLICY:** Grades are based on the total number of points earned out of 700. The grading scale is:  
\[ A \geq 630; \quad B \geq 560; \quad C \geq 490; \quad D \geq 420; \quad F \leq 419 \]  

**Grade Breakdown**  
Laboratory 150 pts  
Homework 50 pts  
4 Exams 400 pts  
Final Exam 100 pts  
700 pts  

**Chapters to be covered**  
9 QUANTUM THEORY  
10 ATOMIC STRUCTURE MOLECULAR ELECTRONIC STRUCTURE  
11 SYMMETRY ROTATIONAL AND VIBRATIONAL SPECTROSCOPY  
12 ELECTRONIC SPECTROSCOPY OF MOLECULES  
13 MAGNETIC RESONANCE SPECTROSCOPY  
14 STATISTICAL MECHANICS (IF TIME PERMITS)  

**EXAMS:** The four exams will be given outside of class time on Monday evenings from 6 to 8 pm. The exam dates are February 4th, March 11th, April 15th, and May 6th.  

**FINAL EXAM:** The final exam is on **Thursday May 16th 8 am to 10 am.**  

**COURSE GOALS:** Students should learn the basic techniques, tools, and theories from the areas of Quantum Mechanics.  

**STUDENT OUTCOME OBJECTIVES:**  
Upon completion of this course students will:  
- Understand the need for the field of quantum mechanics.  
- Derive and understand the three basic models in quantum mechanics.
- Apply basic symmetry to molecular systems.
- Interpret the role of quantum mechanics and symmetry in spectroscopy.

MAKE-UP POLICY: There will be no make-ups in this class.

ATTENDANCE POLICY: Attendance is probably the single most important study aid in physical chemistry. As such, there is an attendance policy. Excused absences must be documented. The first two unexcused absences will not count against you. Upon the third unexcused absence, each absence will result in the removal of three percentage points from your final average.

ACADEMIC HONESTY POLICY: Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on exam, expulsion from the class or expulsion from the University. Use of a programmable calculator is considered cheating.

ACADEMIC DISABILITIES POLICY: Students with Disabilities—To obtain disability related accommodations and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, Room 325, 468-3004/468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided.

CLASSROOM BEHAVIOR POLICY: To ensure a classroom environment conducive to learning, any forms of classroom disruptions will not be tolerated (examples but not limited to – talking, use of cell phones/beepers, sleeping, reading other material, eating/drinking). Students who violate these rules will be asked to leave. Repeat offenders will be subject to disciplinary action in accordance with University policies as described in the Code of Student Conduct.

Instructor reserves the right to change the syllabus at any time.
**Tentative Schedule of Topics (Laboratory)**
Absorption Spectrum of a Conjugated Dye (2 lab periods)
Dipole Moments (1 lab period)
Synthesis and characterization of nanoparticles (2 lab periods)
Research Project (6 lab periods)

We will begin with the first three experiments. Partners will be assigned.

Each student will submit his or her own laboratory report. Laboratory reports will be due at the beginning of the next lab period after the experiment is completed. Late labs will be graded on a 70% scale if they are turned in the same day, and will not be accepted the next day. Your laboratory grade also depends on your laboratory techniques and etiquette.

An additional requirement in lab is that the lab remains clean. I am not your maid and will not clean up after you. **Failure to clean up your glassware and work area will result in the deduction of a minimum of 30 points from everyone’s laboratory grade.**

The format of the lab reports will be given and explained in detail before the first lab report is due. Each student will meet with me after they get back each laboratory report.

**PChem Project:**
You are required to design, carry out, and present the results of a research project during PChem II. The project must be agreed upon by both student and instructor. You must decide on a topic by the beginning of February so that we can order what you need. The project must be complete by the 17th of April. Presentations will start the following week. A formal paper will be written in the ACS JPC (American Chemical Society Journal of Physical Chemistry) style.