

# **CHEM 3400: Physical Chemistry for the Biological Sciences**

## **Summer C Semester 2025**

**Instructor:** Ajith Perera email: perera@ufl.edu  
Office: NPB 2344 Telephone: 352-392-6616

**Time & Place:** In-class lectures, **MWF 8.00 – 9.15 AM, Leigh 207.**

**Office Hours:** **TF 3:00 – 4:00 PM NPB 2344.** Office hours will start in the second week of classes. Specified office hours are only for formal reasons, and if you need help, please feel free to contact the instructor via email to make arrangements.

**CANVAS access:** Students must be able to access CANVAS the e-learning management system utilized by the University of Florida (<https://elearning.ufl.edu/>). Announcements, lecture notes and grades will be managed through CANVAS

**Grading:** % of Final Grade Points

Extra credit	10
Homework	20%
Midterm exam	30%
Final Exam	30%
Two class projects	20%

**Grading scale:** A > 90, A- 87.5 to 89.99, B+ 82.5 to 87.49, B 77.5 to 82.49, B- 75 to 77.49, C+ 72.5 to 74.99, C 67.5 to 72.49, C- 65 to 67.49, D+ 62.5 to 64.99, D 57.5 to 62.49, D- 55 to 57.49. E <60

All grades will be posted on CANVAS

**Midterm exam:** In-class on Friday, June 20

**Final exam:** In-class on Friday, August 8.

**In the exams, you can use a calculator, extra batteries, pencils, erasers, and the provided scratch paper to work out your answers.**

**Please Note:** Conflicts with these exams' dates should be resolved with the instructor no later than one week prior to the exam date. There will be no make-up exams.

**Homework:** Homework problems are assigned throughout the semester on Fridays, and they are due the following Friday.

## **COURSE MATERIALS**

A computer or laptop to access. Tablets and cell phones may be used to complete assignments.

**Recommended textbook:** "Physical Chemistry, Principles and Applications in Biological Sciences" by I. Tinoco, K. Sauer, J. C. Wang, J. S. Puglisi, G. Harbison, D. Rovnyak, 5<sup>th</sup> Edition, Pearson (2014).

**Calculator:** A **calculator** is required and should be brought to every lecture. Calculators will be use on examinations too. However, students must not use programs, communication capabilities or apps on the calculator or computer during quizzes and examinations. Failure to comply with this policy is considered a serious violation of the student honor code.

## **Learning Objectives:**

Upon completion of this course, a student will be able to:

- Use the ideal gas law and apply the kinetic theory of gases.
- Use a distribution function.
- Apply the first and second laws of thermodynamics to biochemical systems.
- Discuss and calculate properties of non-electrolyte and electrolyte solutions,
- Calculate an equilibrium constant and relate it to the free energy.
- Calculate the electromotive potential for electrochemical cells and for electron transfer in biological processes.
- Determine rate constants, rate laws, and mechanisms for chemical reactions of biological interest.
- Fundamentals of atomic/molecular structure and spectroscopy.

**Course Overview:** This course covers fundamental topics of physical chemistry for biological systems. The course is primarily designed for biological majors. In this course, we will cover chapters 1-10 of the textbook.

**Attendance:** Lecture attendance is essential for your success in this class. However, we will not take roll.

**Course Evaluations:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>

**Honor code:** The student honor code can be found at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>, <https://registrar.ufl.edu/>

The students and instructor(s) are honor-bound to comply with the Honors Pledge:

*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*

*On all work submitted for credit by students at the university, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this assignment.*

**Students with disabilities:** Students requiring special accommodations need to register at the Dean of Student Offices and bring the documentation to the instructor.

Counseling services are available at <https://counseling.ufl.edu/> or call (352)-392-1575 during regular service hours (8am-5pm). For other hours or weekends, call the Alachua County Crisis Center (352-264-6789).