**CHEM 407- Section 001: Physical Chemistry I (3 credits)**

**Class Meetings:**

MWF 11:00 – 12.15 a.m., Sims 105

**Instructor:**

Dr. Clifton Harris

Office: Sims 302B

E-mail: harrisc@winthrop.edu

Phone: x 4929

**COURSE WEBSITE: www.chem.winthrop.edu**

**Office Hours:**

You will be sure to find me in my office on **T 930-1030 and W 200-300 p.m.** You are welcome to make an appointment to meet at other times. You may also feel free to send me questions via e-mail. I have an open door policy, so if I happen to be in my office outside of these hours, feel free to come in.

**Course Materials:**

* Textbooks:
  + **Required Text**: Physical Chemistry, Ball, Cengage Learning
  + Suggested Text: Applied Mathematics for Physical Chemistry, Barrante, 3rd Edition
* Calculator:
  + Any scientific or graphing calculator. Cell phones are prohibited during quizzes and exams.

**Attendance Policy:**

There is no mandatory attendance policy. However, you are strongly encouraged to attend every lecture as the order of the course material **will** deviate from the book. You are responsible for keeping track of all covered course materials, due dates and exam/quiz dates.

**Course Goal:**

Physical chemistry describes the applications of pure physics to chemical phenomena. The first semester of physical chemistry expands greatly upon general chemistry topics such as gas laws, thermodynamics, electrochemistry, and kinetics. During this course, you will learn the conceptual and mathematical foundations of fundamental laws of chemistry, and apply these to real and theoretical systems.

**Outline of Topics to be covered:**

Week 1:Calculus review

Week 2: Kinetic theory (Ch 19)

Week 3: Gas laws (Ch 1)

Week 4: State Functions, Heat Capacities (Ch 2) **EXAM 1**

Week 5: Second and Third Laws of thermodynamics, heat engines (Ch 3)

Week 6: Spontaneity conditions, Free energy change (Ch 4)

Week 7: Maxwell’s thermodynamic equations, chemical potential, fugacity (Ch 4)

Week 8: (Fall break, 10/12-10/15), Chemical Equilibrium (Ch 5) **EXAM 2**

Week 9: Phase diagrams, single component systems (Ch 6)

Week 10: Equilibria of multi-component systems (CH 7)

Week 11: Intro to electrochemistry, non-PV work, electrochemical potentials (Ch 8)

Week 12: Intro to quantum mechanics (Ch 9) **EXAM 3**

Week 13: Kinetics (Ch 20)

Week 14: THANKSGIVING WEEK (NO CLASS)

Week 15: Intro to Statistical Thermodynamics (Ch 17)  **EXAM 4**

**FALL BREAK: Fri, October 12- Mon, October 15**

**INTERIM GRADES DUE: October 4th**

**Drop Deadline: October 19th**

**FINAL EXAM: Thursday, December 6 @ 8:00 a.m.**

**Study Tips:**

**Work in groups**. Other students are your greatest resource. Stay on top of the material by reviewing the textbook in your free time. Use other textbooks for reference. Do additional practice problems as well. **Make sure you UNDERSTAND the material. Do not simply memorize examples**. This will not prepare you for the exams. **Try variations of problems to ensure complete understanding**.

**Lectures:** Lectures will be done (mostly) by whiteboard. Lecture notes will be provided and posted to the course website. Visit [www.chem.winthrop.edu](http://www.chem.winthrop.edu). Click ‘courses’ and find the corresponding webpage.

**Homework**: There will be regularly assigned homework assignment in this course. The due dates of these assignments will be given in class. These assignments will be posted to the website.

**Quizzes**: Announced *and* unannounced quizzes will be given throughout the semester. These quizzes may vary in weight at my discretion.

**Quiz-correction reports**: You will have opportunities to improve your quiz grades if you choose to do so. Students may submit quiz-correction reports. In these reports, you will explain in full detail why your previous answer was incorrect, as well as the logic you applied to obtain the correct answer. All work must be shown. A grade will be assigned to the report, and your new quiz grade will be the average of the original quiz score and the report score. These reports **MUST BE NEAT AND THOROUGH.**

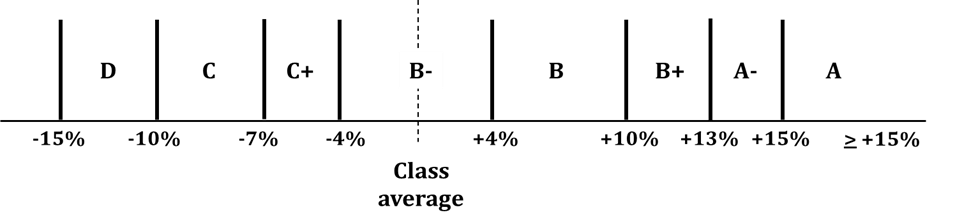
**Exams**: Four 100-point exams will be given in class on the dates shown below. If you will be unable to take an exam at the scheduled time due to participation in a University-approved activity (such as an athletic meet), **you must make arrangements in advance to take the exam at another time**. If you are absent on the exam date without prior approval and do not provide a written doctor’s excuse, you will receive a zero for that exam. *Exams will be open-book.*

**Assignments:**

Homework: 20 % Quizzes: 10 %

Exams: 50 % Final Exam: 20 %

**Grading scale (Avg < 75)**:

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**ONCA Statement**

The Office of Nationally Competitive Awards is here to help you find and apply for scholarships, fellowships, and awards for everything from study abroad to graduate school tuition.  Please check out the ONCA website at [www.winthrop.edu/onca](http://www.winthrop.edu/onca) and fill out a Student Information Form, then email Dr. Bickford at [onca@winthrop.edu](mailto:onca@winthrop.edu) to make an appointment.  The right nationally competitive award is out there for YOU!

**Students with Disabilities/Need of Accommodations for Access:**

Winthrop University is committed to providing access to education.  If you have a condition which may adversely impact your ability to access academics and/or campus life, and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 803-323-3290, or, [accessibility@winthrop.edu](mailto:accessibility@winthrop.edu). Please inform me as early as possible, once you have your official notice of accommodations from the Office of Accessibility.

OA Staff:

* Tina Vires – Program Director, extension 6174; [virest@winthrop.edu](mailto:virest@winthrop.edu)
* Shardae Nelson– Assistant Coordinator, extension 6188; [nelsons@winthrop.edu](mailto:nelsons@winthrop.edu)
* Hope Williams – Administrative Specialist, extension 3290; [accessibility@winthrop.edu](mailto:accessibility@winthrop.edu)
* Susan Sistar – Coordinator for Testing Program and the Test Center, extension 6173; [sistars@winthrop.edu](mailto:sistars@winthrop.edu) or [testcenter@winthrop.edu](mailto:testcenter@winthrop.edu)
* From off campus – 803/323-3290

**The Office of Victims Assistance Syllabus Statement** : The Office of Victims Assistance (OVA) provides direct services to survivors of sexual assault, domestic violence, dating violence, and stalking as well as campus-wide educational programming to prevent these crimes from occurring. The staff provides counseling services and assists with obtaining sexual assault forensic exams, STI testing/treatment, pregnancy prevention, housing options, legal prosecution, and access to other support services including assistance with class or course problems resulting from victimization (i.e. missed classes, trouble concentrating or completing assignments). The OVA is located in 204 Crawford and can be reached at (803) 323-2206.  In the case of an after-hours emergency, please call Campus Police at (803)323-3333, or the local rape crisis center, Safe Passage, at their 24-hour hotline, (803)329-2800.

**Academic Integrity :** Any instances of academic misconduct will be dealt with as outlined in the Student Conduct Code (Sect. V), found in the *Student Handbook* (http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf).

**Syllabus Change Policy :** Changes to the policies listed here may be made at the instructor’s discretion. Students will be notified of any modifications.