Graduate Physical Chemistry  
CHEM 6325.011 and 021  
Spring 2019  
EHABW 2.212/BLIBR 2.206  
TR 3:05pm-4:20pm

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Hours: TWR 11am-12pm or by appointment

Textbook and/or Resource Material
Title: Thermodynamics, Statistical Thermodynamics, Kinetics 2nd Ed.
Authors: Thomas Engel and Philip Reid  
Publisher: Prentice Hall  
ISBN: 9780321615039

or

Title: Physical Chemistry 3rd Ed.
Authors: Thomas Engel and Philip Reid  
Publisher: Pearson  
ISBN: 9780321812001

Calculator with scientific notation, exponential, log/ln, y^x.

Course Description
The Graduate Physical Chemistry is an introduction of thermodynamics including the Thermodynamics laws, thermal chemistry, chemical equilibrium, gas laws, and phase equilibria with extension into modern statistical methods. It is a fundamental approach to the study of physical and chemical phenomena.

Prerequisites
Undergraduate Physical Chemistry (CHEM 3304 and 3305 or equivalent) – graduate status.

Learning Objectives/Outcomes for the Course
1. Understand the concepts of the principles, laws, and theories of physical chemistry
2. Perform basic calculations regarding heat changes and equilibrium constants
3. Use thermodynamic concepts, data, and models in solving complicated problems
4. Demonstrate the ability to communicate chemical knowledge and work independently
5. Appreciate the importance of thermodynamics in everyday life

Learning Objectives for Core Curriculum Requirements
This course is not part of the UTRGV core curriculum inventory. The course objectives include critical thinking skills, communication skills, empirical and quantitative skills.

Attendance
University policy requires that students attend lectures on time. Any student who misses three lectures without notice and has no excuse can and may be dropped from the course. If students arrive habitually late for class, or are disruptive in any way, they may be asked to leave the room. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

Grading Policies
Done according to scale
100-90 = A, 89-80 = B, 79-70 = C, 69 or less = F (Graduate students cannot get Ds)

Contributors:
- Quizzes (given weekly) 15%
- Homework Sets 15%
- Unit Examinations 50%
- Comprehensive Final Exam 20%
- (Report 10%)
Unit Examinations

**Style:** problems similar to homework, some thinking exercises on the concepts, understand the “vocabulary” well.

**Number:** three unit examinations plus the final examination.

**Difficulty:** a few easy things, but then they get difficult.

**Time:** limited.

**Resources:** formula sheet and calculator.

**Make-up Exams:** Only for official university events such as a member of the band for a concert, an athlete for a contest; or an approved holiday. Otherwise the missed examination will be the score that is dropped.

**Note:** The lowest term exam score will be dropped. You decide which exam you want to drop/miss for any reason. Missing two exams usually results in an F for the course.

Final Exam

**5:55-7:30pm, Thursday, May 9, 2019**

Students must take the final exam to pass the course. There is no make-up for the final exam.

Report

Tentatively, there will be a report due. It will focus on Physical Chemistry and your research. You will have to describe the principles of Physical Chemistry that are pertinent to your research, provide equations, and discuss how it applies to your research project. More information will be forthcoming.

Steps to a Good Result

Although Physical Chemistry has the reputation of being a hard course, there is a way to be successful in this course. As one can see in the Student Learning Outcomes, a major course goal is to understand various fundamental concepts of the principles, laws, and theories of physical chemistry. Once the concepts are properly understood, the student will be able to perform basic calculations and use them to solve problems.

It is imperative that you do homework. The homework problems will be representative of the kinds of questions will be given on the examinations. The student may work alone or in a group. However, each student must turn in their own homework. Solutions to the problems will be posted on Blackboard. It is important that the homework be completed before the solutions are posted for the student to gain adequate practice with the material.

Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>January 14</td>
<td>First day of classes</td>
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<tr>
<td>January 17</td>
<td>Last day to add a course or register for spring 2019</td>
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<tr>
<td>January 21</td>
<td>Martin Luther King Jr. Day – NO classes</td>
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<tr>
<td>April 10</td>
<td>Last day to drop a course; will count toward the 6-drop rule</td>
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<tr>
<td>April 19-20</td>
<td>Easter Holiday – NO classes</td>
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<tr>
<td>May 2</td>
<td>Study Day – NO classes</td>
</tr>
<tr>
<td>May 3-9</td>
<td>Final Exams</td>
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<tr>
<td>May 10-11</td>
<td>Commencement Exercises</td>
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Course Drops

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and cannot drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

Students with Disabilities

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact **Student Accessibility Services (SAS)** as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.
Pregnancy, Pregnancy-related, and Parenting Accommodations
Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services:
Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Mandatory Course Evaluation Period
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:
Module 1 February 13 – 19
Module 2 April 10 – 16
Full Spring Semester April 10 – May 1

Scholastic Integrity
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

Sexual Harassment, Discrimination, and Violence
In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at 665-8287, 882-8282, or OVAVP@utrgv.edu.

Student Services
Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor's office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

- Learning center: BSTUN 2.10 (Brownsville) or ELCTR 100 (Edinburg)
- Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg)
- Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg)
- Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)
Tentative Class Schedule

Jan 15    Syllabus and Math Quiz
Jan 17    Chapter 1/Chapter 2
Jan 22/24  Chapter 2
Jan 29/31  Chapter 2/Chapter 3
Feb 5/7    Chapter 3/Chapter 4

**Feb 12**    Unit Examination 1 (Chapters 1-3)

Feb 14    Chapter 4
Feb 19/21  Chapter 5
Feb 26/28  Chapter 5/Chapter 6
Mar 5/7    Chapter 6/Chapter 7

Mar 12/14  SPRING BREAK – No Class

**Mar 19**    Unit Examination 2 (Chapters 4-6)

Mar 21    Chapter 7/Chapter 8
Mar 26/28  Chapter 8/Chapter 9
Apr 2/4    Chapter 9/Chapter 12
Apr 9/11   Chapter 12/Chapter 13

**Apr 16**    Unit Examination 3 (Chapters 7-9)

(Apr 10    Last Day to Drop Classes)

Apr 18    Chapter 13
Apr 23/25  Chapter 14/Chapter 15
Apr 30    Chapter 15

May 3    Study Day - Review for Final

**May 9**    Final Exam (5:55pm-7:30pm)