

	Physical Chemistry II / CHM 358
College/Department	Chemistry
Semester	Spring 2017
Instructor	Dr. Brian Scott Day
Email	day17@marshall.edu
Phone	(304) 696-7054
Office	Science Building, 479
Location	Lecture: Science Building 405 Laboratory: Science Building 470
Days/Times	9:30 – 10:45 AM, TR Lecture 1:00 – 2:50 PM, W Lab Section 201 3:00 – 4:50 PM, W Lab Section 202
Office Hours	1:00 – 3:00 TR and 11:00 – 12:00 W (S-460)

Information for drop or withdraw is available on the Academic Calendar
<http://www.marshall.edu/calendar/academic/>

COURSE MATERIALS

1. *Physical Chemistry: Thermodynamics, Structure, and Change, 10th Edition* by Atkins and de Paula (either full textbook or Volume 1 will suffice)
2. *Applied Mathematics for Physical Chemistry*, 3rd Edition by Barrante (recommended)
3. Access to MU Online and a Marshall email account
4. Bound notebook (not spiral) for lab
5. Indirectly vented chemical safety goggles for lab
6. Calculator
7. ACS academic lab safety guide (volumes I and II)
<http://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/chemical-safety-in-the-classroom.html>

COURSE DETAILS

Description:

A systematic study of physical chemistry, including the topics of energy transfer, statistical thermodynamics, equilibrium, and kinetics. 4.00 credits. Prerequisites: grade of C or higher in CHM 212, C or higher in 8 hours of physics, C or higher in MTH 230, or consent of instructor.

Objectives:

1. To apply concepts of thermodynamics, kinetics, chemical equilibrium, and properties of gases to problems of chemical significance.
2. To learn how to apply general chemical knowledge to solve basic chemistry problems and to implement these logical strategies to solve complex, multistep problems.
3. To understand and interpret scientific literature.
4. To refine oral communication skills.
5. Students will enhance their writing skills and strategies.

COURSE OUTCOMES

Student Learning Outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Students will use the laws of thermodynamics to understand energy transfer among matter and to derive relationships relating energy transfer and physical observables.	<ul style="list-style-type: none"> • lectures and readings on thermodynamics • homework 	<ul style="list-style-type: none"> • tests and quizzes • lab reports
Students will understand how statistics and the energy of a system governs the rate and extent of chemical reactions.	<ul style="list-style-type: none"> • lectures and readings on statistical mechanics, equilibrium, and reaction kinetics • homework 	<ul style="list-style-type: none"> • tests and quizzes
Students will apply algebra and calculus to solving problems of chemical and thermodynamic significance.	<ul style="list-style-type: none"> • weekly recitations • homework 	<ul style="list-style-type: none"> • tests and quizzes
Students will understand, interpret and discuss scientific literature.	<ul style="list-style-type: none"> • journal clubs 	<ul style="list-style-type: none"> • students will write critical evaluations of journal articles
Students will enhance writing skills and strategies.	<ul style="list-style-type: none"> • low-stakes short essays in homework sets, quizzes, and exams • editing conferences with Dr. Day 	<ul style="list-style-type: none"> • lab reports • lab notebook • tests and quizzes • journal critiques
Students will refine oral communication skills.	<ul style="list-style-type: none"> • journal club discussions • group work in lab 	<ul style="list-style-type: none"> • group presentations

GRADING

	Percent of Grade
Homework/Quizzes	15
Lab Notebook	5
Lab Reports	20
Journal Article Critiques	10
In-Class Exams (2)	30
Final Presentation	5
Final Exam	15

A 90 -100 %, B 80 -89 %, C 70 - 79%, D 60 - 69 %, F 0 - 59 %

COURSE SCHEDULE AND ACTIVITIES

Week of	Topic/Chapter(s)	Lab
1/9	Foundations / Math Review	Intro
1/16	Gas Properties / Chapter 1	No Lab
1/23	1 st Law of Thermodynamics / Chapter 2	2 nd Virial Coefficient
1/30	2 nd Law of Thermodynamics / Chapters 2&3	Journal Club
2/6	2 nd Law of Thermodynamics / Chapter 3	Adiabatic Expansion
2/13	Entropy and 3 rd Law / Chapter 3; Exam 1	Adiabatic Expansion
2/20	Helmholtz and Gibbs Energies/ Chapter 3	Journal Club
2/27	Phase Equilibria / Chapter 4	Bomb Calorimetry
3/6	Mixtures & Solutions / Chapter 5	Bomb Calorimetry
3/13	Chemical Equilibrium/ Chapter 6	
3/20	<i>Spring Break</i>	
3/27	Molecules in Motion / Chapter 19	Journal Club
4/3	Chemical Kinetics / Chapter 20	Clock Reactions
4/10	Chemical Kinetics / Chapter 20	Clock Reactions
4/17	Reaction Dynamics / Chapter 21; Exam 2	No Lab
4/24	Group Projects	Review
5/2	8:00 – 10:00 FINAL EXAM	

Writing-Across-the-Curriculum Designation

This course has been designated “WI,” or writing-intensive. Throughout the course, students will develop the ability to comprehend the concepts of physical chemistry and interpret them for others through written communication. The following course activities are examples of how students will develop their writing skills this semester.

Homework sets- each will include at least one qualitative, short-response question

Exams- approximately 20% of exam content will require written responses (without calculations)

Lab notebook- standards of industry and academia will be reinforced

Journal club- written responses to analytical critique questions

Lab reports- written in the style of research manuscripts

Group projects- PowerPoint slides will be written to effectively complement the presentations

You are required to upload the final, revised version of your Adiabatic Expansion Lab report from this class into Blackboard. Detailed instructions will be given. Your grade for this assignment will not be counted in your final grade until you complete the upload.

COURSE POLICIES

Attendance Policy

Attendance for this class is not mandatory, but highly recommended. Absences from quizzes, exams and laboratories can only be made-up if the absence falls within one of the categories outlined in the undergraduate catalog as an excused absence. To make-up a quiz, exam or lab, you will need to follow the process for securing an excused absence. All excused absences must be obtained as soon as possible.

Laboratory Policies

1. Students must complete the lab safety training on MU Online prior to entering the laboratory.
2. Goggles are required at all times during lab.
3. Open-toed shoes, shorts, bare midriffs, etc. are not allowed
4. Blatant disregard for standard safety practices will result in dismissal from lab

Other Course Policies

1. Homework and lab reports will not be accepted after their due dates.
2. Cell phones cannot be used, or out, during exams.
3. Sharing calculators during quizzes/exams is prohibited.
4. During quizzes/exams, all materials necessary will be provided to you except a pencil and calculator. You may NOT use your own paper, etc.
5. Please turn off cell phones during class, failure to do so may result in dismissal from lecture.
6. Class announcements may be made via email to your university email address and it is your responsibility to check that account on a regular basis.

UNIVERSITY POLICIES

Academic Dishonesty

All students should be familiar with the university's policy concerning academic dishonesty. This policy can be found on pp. 66 - 68 of the undergraduate catalog http://www.marshall.edu/catalog/undergraduate/ug_10-11_published.pdf, or on pp. 61 – 63 in the 2009 online graduate catalog http://www.marshall.edu/catalog/graduate/S2009/gr_sp09_published.pdf. (Faculty are encouraged to add any additional information specific to their expectations and/or rules regarding academic dishonesty in their class).

Policy for Students with Disabilities

Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.

University Computing Services' Acceptable Use Policy:

All students are responsible for knowing this policy, which can be found on the web at <http://www.marshall.edu/ucs/CS/accptuse.asp>.

Affirmative Action Policy:

This course will follow Marshall University's policy on Affirmative Action, which can be found on p. 63 of the undergraduate catalog http://www.marshall.edu/catalog/undergraduate/ug_10-11_published.pdf, or on pp. 16-17 of the 2008 graduate catalog http://www.marshall.edu/catalog/graduate/S2009/gr_sp09_published.pdf. Specifically, all students will be afforded equal opportunity without regard to race, color, sex, religion, age, disability, national origin, or sexual orientation.