

PHYSICAL CHEMISTRY (LECTURE)



Department of Biological, Chemical and Physical
Sciences

CHEM 321/421-24A

Course Syllabus
Fall 2017

Instructor. Murat Kahveci, Ph.D.

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Course meetings. Lectures (CHEM321/421-24A)

M 6:00 PM – 7:45 PM (SCH562)

W 6:00 PM – 6:45 PM (SCH562)

Discussion^b (Lab/Lecture)

M 7:50 PM – 08:40 PM (SCH562)

Course dates. Start: August 28

Final Exam: December 13 (Regular class hour)

Credit hours. 3

Office hours^c. Schaumburg (SCH600R)

M 5:00 – 6:00 PM

W 5:30 – 6:00 PM

Required textbook^d. Atkins, P. and Paula, J. D. (2010). Physical chemistry. Oxford University Press, New York, 9th edition. ISBN-13: 978-1429218122

Suggested text. Moog, Spencer, and Farrell "Physical Chemistry: A Guided Inquiry-Thermodynamics"

Donald A. McQuarrie, "Mathematics for Physical Chemistry: Opening Doors"

Primary research articles on physical chemistry are published in a variety of journals that are available in the library including the ACS journals (see <http://pubs.acs.org>): *Journal of the American Chemical Society* and *Journal of Physical Chemistry*, etc.

Prerequisites. CHEM 212 with a min grade of C-. MATH 232 with a min grade of C-.

^aExpect a reply within two days, excluding Saturdays and Sundays.

^bAll students registered for CHEM 321/421-A are required to attend discussion section, regardless of the registration for the CHEM 321/421-B – lab section.

^cIf your schedule conflicts with these office hours, please make an appointment with the instructor.

^dTenth edition of Physical Chemistry by Peter Atkins and Julio de Paula can also be used.

OVERVIEW

This course is designed to present the principles of physical chemistry that govern equilibria and reaction rates in chemical systems. Topics include first, second, and third law of thermodynamics, chemical equilibrium, phase equilibrium and kinetic theory of gases, reaction kinetics and mechanism.

The university's three overall learning goals for undergraduate students are:

- effective communication,
- knowledge of disciplined-focused content, and
- awareness of social justice and engagement in civic life.

LEARNING OUTCOMES

At the end of this course you should be able:

- to determine direction and extent of chemical reactions and physical transformation of chemical substances based on their thermodynamic characteristics (and vice versa),
- to determine possible amount of heat produced and work done by chemical systems, and
- to predict rates of chemical transformations based on kinetic characteristics and vice versa.

This class will consist of lectures, class discussions and in-class practice in problems solution. Each students should check regularly Blackboard for announcements and course information.

BLACKBOARD LMS

Homeworks and their solutions, test solutions and grades will be posted on the Blackboard.

Last updated: January 15, 2018

TENTATIVE SCHEDULE OF LECTURES, ASSIGNMENTS AND TESTS

Date	Topics	Homeworks
08/28	Fundamentals (F1–F7)	
08/30	The properties of gases (Ch 1)	
09/04	Labor Day – no classes	
09/06	Ch 1: cont'd	HW1 Due
09/11	The First Law (Ch 2)	
09/13	Ch 2: cont'd	
09/18	Ch 2: cont'd	
09/20	Quiz #1/The Second and Third Laws (Ch 3)	HW2 Due
09/25	Ch 3: cont'd	
09/27	Ch 3: cont'd	
10/02	Phys. trans. pure substances (Ch 4)	HW3 Due
10/04	Ch 4: cont'd	
10/09	Review	HW4 Due
10/11	Exam #1	
10/16	Simple mixtures (Ch 5)	
10/18	Ch 5: cont'd	
10/23	Ch 5: cont'd	
10/25	Chemical equilibrium (Ch 6)	HW5 Due
10/30	Ch 6: cont'd	
11/01	Ch 6: cont'd	
11/06	Quiz #2 / Chemical Kinetics (Chap 21 and Chap 23.1 in 9 th ed. or Ch 20 in 10 th ed.)	HW6 Due
11/08	Chap 21: cont'd	
11/13	Chap 21: cont'd	
11/15	Chap 21: cont'd	
11/20	Review	HW7 Due
11/22	Thanksgiving Holidays – no classes	
11/27	Exam #2	CHEM421 presentations
11/29	Reaction dynamics (Chap 22 in 9 th ed., Ch 21 in 10 th ed.)	
12/04	Chap 22: cont'd	CHEM421 presentations
12/06	Review	HW 8 Due / CHEM421 Papers Due
12/13	Final Exam	

GRADING

CHEM 321

- Homeworks20%
- Quizzes10%
- Exam I20%
- Exam II20%
- Final Exam30%

CHEM 421

- Homeworks16%
- Quizzes10%
- Project4%
- Exam I20%
- Exam II20%
- Final Exam30%

FINAL GRADE DISTRIBUTION BY TOTAL POINTS

Letter grades will be assigned according to the following grade intervals.

• A92.0 and more
• A-89.0 – 91.9
• B+86.0 – 88.9
• B82.0 – 85.9
• B-79.0 – 81.9
• C+76.0 – 78.9
• C72.0 – 75.9
• C-69.0 – 71.9

• D+	66.0 - 68.9
• D	62.0 - 65.9
• D-	59.0 - 61.9

• F	below 59.0
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HOMWORKS

There will be 8 homeworks covering particular topics according to chapters in the textbook. Each 100% completed homework will correspond to 2.5 points (for CHEM321) or 2 points (CHEM421). Paper copies of homeworks should be turned in according to the schedule. Late assignments will be accepted only in the cases when students made prior arrangement (due to documented emergency or illness).

QUIZZES

Two 30 min quizzes will be given during the course of the semester. They will be announced in advance. There will be also several short unannounced quizzes at the beginning of some classes.

IN-CLASS EXAMS

There will be two hour exams during the course of the semester and the final exam. 1st midterm exam contains questions from Chapters 1 to 4, 2nd exam – questions from Chapters 5, 6, 21. The final exam includes material from the entire semester.

CHEM421 students will have a short paper (5-7 pgs) on an article published in a peer-reviewed journal. The topic should be something covered in class and must meet instructor's approval. The paper is due on December 06. Each student will make short (7-10 min) presentations of the paper.

ADDITIONAL ITEMS OF NOTE

- Attendance in the class is strongly encouraged to successfully complete this course. You are responsible for any classes that you miss. Have telephone numbers of others in the class, get assignments, notes, deadlines etc. from them or e-mail the instructor.
- During quizzes and exams, only pencils, erasers, and non-programmable calculators will be allowed on desktops and laps. Calculators with communications capability are forbidden. All other items must be put on the floor or away from the student's desk.

- There will be no make-ups for any missed quizzes and hour exams except for the case of documented emergency or illness. In these cases, they will be given at instructor discretion and may include point deduction. There will be no make-up for the final exam.
- Extra-points. There will be several short 2-3 min unannounced quizzes at the beginning of some of classes. They will include typically 1-2 questions, and you will be able to earn 1 additional point for each quiz (if you answer questions correctly).
- Cell phones, beepers, and other electronic communication devices must be turned off and removed from your desktop during all class periods.
- Changes to this syllabus may be made when deemed appropriate.

POLICIES

ACADEMIC DISHONESTY

The university's policies on issues such as plagiarism, recycling, cheating and other forms of academic dishonesty can be found in the undergraduate catalog at <http://catalog.roosevelt.edu/undergraduate/policies/academic-integrity-policy> and the graduate catalog at <http://catalog.roosevelt.edu/graduate/policies/academic-integrity>. Additional guidelines for avoiding plagiarism are available here: <https://www.roosevelt.edu/current-students/academics/academic-integrity>.

DISABILITY

Roosevelt University complies fully with the Americans with Disabilities Act. Details about ADA and Roosevelt's policies and practices are found in the following link: <https://www.roosevelt.edu/student-experience/disability-services>. If you have a condition or disability that requires reasonable accommodation, please alert your instructor or the Academic Success Center as soon as possible, certainly before any assignment or classroom activity that requires accommodation. The Academic Success Center is located in AUD1050 (inside the Library) in Chicago, and the phone number is 312-341-3818. In Schaumburg, the office is in room 125, and the phone number is 847-619-7978. Email Adam Wouk or Danielle Smith at dsmith51@roosevelt.edu.

WITHDRAWAL/INCOMPLETE GRADES RULES

I (INCOMPLETE)

A grade of Incomplete may be given only with the consent of the instructor and appropriate notification to the registrar. An Incomplete grade specifies to the student and to the registrar that only a small portion of the total semester's work needs to be completed (e.g., the student must take a final examination, complete a paper, or similar requirements), that the student is academically able to complete the work, and that the student has presented a satisfactory reason to the instructor for not completing the work within the deadline of the regular semester. Students must complete the course requirements prior to the end of the following term. A student may also be given an extension of an Incomplete due to extraordinary circumstances, for example if the instructor will not be available during the following semester to ensure that the work is completed. Under such circumstances, the instructor will submit an extension date in writing to the registrar. The Incomplete grade will be removed when the instructor submits a letter grade evaluating academic progress (A, B, C, D, P, F) within the above deadline. If no grade is submitted and no extension granted, the registrar will automatically convert the Incomplete grade on the deadline date to the default grade (B, C, D, or F) submitted by the faculty member at the time of granting the original Incomplete grade.

WITHDRAWAL

The final date for an official withdrawal from this class (meaning a "W" would appear on your transcript) is November 02. In order to withdraw after that date, you must petition for a late withdraw with the registrar. Petitions are granted only for non-academic reasons after the deadline. You should consult your academic advisor if you are considering withdrawing from a course. If you receive financial aid, also check with your financial aid counselor to assure that aid isn't affected by withdrawing from a class. The complete withdrawal policy is here: <https://www.roosevelt.edu/current-students/academics/register-classes>.

RELIGIOUS HOLIDAYS

Roosevelt University policy requires written notification to the instructor within the first two weeks of the term. Any work you miss because of a religious holiday can be made up. You can see the full policy here: <https://www.roosevelt.edu/policies/religious-holidays>.

STUDENT CODE OF CONDUCT

Students enrolled in the university are expected to conduct themselves in a manner compatible with the university's function as an educational institution. <https://www.roosevelt.edu/current-students/get-help/complaint/student-misconduct>.

TITLE IX

Roosevelt University cares greatly about the health and well-being of our students, staff, faculty, and guests to our campuses. Federal law, specifically Title IX, and the University Sexual Misconduct Policy require that all employees are mandated reporters of incidents involving sexual or gender-based violence or harassment.

Disclosures made to faculty or teaching assistants (TAs) about sexual or gender-based harassment, sexual assault, dating violence, domestic violence, and/or stalking on or off campus must be forwarded to the Title IX Coordinator. The above listed staff are Responsible Employees and therefore are mandated to report. The Title IX office will contact any student who discloses an incident regarding student rights, including the option to request an investigation, interim safety measures, and/or academic accommodations. In certain circumstances, the Title IX Coordinator may need to proceed with an investigation, even if none is requested, if there are safety risks to the student or campus community. Participation in the process is voluntary.

If you want a confidential place to disclose sexual assault, sexual harassment or intimate partner violence, there are two confidential advisors on campus who are not mandated reporters. They are: Audrey Guy (312)244-0577, LaDonna Long (312)244-0426. Both are available via phone all hours. The Counseling Center (430 S. Michigan Avenue Room 470 Phone: 312-341-3548) staff are also NOT mandatory reporters and therefore not required to report a disclosure to the Title IX Office.