BCHM 320/420
Physical Chemistry for Biosciences

Murat Kahveci, Ph.D.

mkahveci@roosevelt.edu (Will respond within 48 hours)
Office: SCH 600 | WB 716D
Phone: 312-341-6357 | 847-619-8550

Course Meetings

Asynchronous via Blackboard. Lecture videos will be available on Mondays.

Course Dates

1/19 to 5/10

Office Hours

By appointment

Discussion Hours

Mondays at 4—5 PM via Zoom

Course Zoom Address

https://roosevelt.zoom.us/j/96302570939?pwd=eDFSSVhHUWF2NWg2NlZYVTgzYS9YUT09

Credit Hours

Lecture: 3 credits (Cross-listed with BCHM 320-01 and BCHM 420-01 and BCHM 420-20)

Prerequisites

CHEM 212 with a min grade of C-. BIOL 301 recommended.

Course Textbook

Required

Atkins, P., & de Paula, J. (2011). *Physical chemistry for the life sciences* (2nd ed.) [(ISBN-13: 978-1-4292-3114-5; ISBN-10: 1-4292-3114-9)]. Oxford University Press

Ebook version is available at the publisher's website.

Course materials including the asynchronous lecture videos will be available at http://roosevelt.blackboard.com; thus, the course website should be regularly visited in a week.

Suggested

Trapp, C., & Cady, M. (2011). *Physical chemistry for the life sciences solutions manual to accompany* [(ISBN: 978-0-19-960032-8)]. Oxford University Press

Course Overview

This course is designed to present the principles of physical chemistry that govern molecular structure and chemical reactivity in biochemical systems and the methods used for their investigation. Topics include solution thermodynamics, kinetics and equilibria, quantum mechanics and modern spectroscopic techniques, and their application for the study of structure and functioning of biomolecules. The course will focus on the answering questions such as, "How do we know whether a (bio-) chemical reaction will occur?", "How fast will it go?", "Will it consume or produce energy?", "Why do atoms stick together to form molecules?", "How do we determine and understand structures of biomolecules?" The course requires one year each of general chemistry and organic chemistry (CHEM 101, 202, 211, 212) as well as MATH 217 and 231. BIOL 301 is recommended.

Course Expectations

After finishing the BCHM 320 course, students are expected to know basics of thermodynamics, kinetics and quantum mechanics and spectroscopic techniques; and they should be able to calculate reaction equilibria and rates, and to determine and/or describe structures of atoms and molecules.

The course material will closely follow the text, so it is to the students' advantage to read the text. Students should read the appropriate material before lecture.

Note: **Exams will closely follow homework assignments, so it is to the students' advantage to understand the material covered in homework sets.**

Grading

BCHM 320

	Weight
Homeworks	24%
Group Project (Paper and Presentation)	6%
Quizzes	20%
Midterm Exam	20%
Final Exam	30%

BCHM 420

	Weight
Homeworks	16%
Group Project (Paper and Presentation)	14%
Quizzes	20%
Midterm Exam	20%
Final Exam	30%

Final grade distribution by percentage of total points

Letter	Percent Range
A	$92 - 100$
A-	$89 - 91$
B+	$86 - 88$
B	$82 - 85$
B-	$79 - 81$
C+	$76 - 78$
C	$72 - 75$
C-	$69 - 71$
D+	$66 - 68$
D	$62 - 65$
D-	$59 - 61$
F	< 58

Homework

There will be 7 homework sets covering particular topics according to chapters in the textbook. They will be due according to the schedule. **Late homework assignments will not be accepted.**

Quizzes

There will be two 40 min quizzes (see schedule).

Exams

There will be one midterm exam (1 h 15 min) and a final exam (2 h 30 min). The midterm exam contains questions from Chapters 1 to 7. The final exam includes material from the entire semester. **There will be no make up exams.**

Exam Rules

Because this course is offered in an Online: Asynchronous modality, exams will be administered during the normal class time through Blackboard using both Lockdown Browser and Respondus Monitor (or similar software to provide autoproctoring) to ensure the integrity of the exam. These apps require the use of a computer with a webcam, so please make sure you are able to use and work with the technology before the first exam.
Items not allowed during exams include (but are not limited to):

- Cell phones or pagers (Note: you cannot use the calculator on your cell phone for exams)
- MP3 players (e.g., iPods)
- Hats (e.g., baseball cap)
- Notes of any kind
- T extbooks
- Graphing calculators or calculators with a programmable memory Interaction with other people (either electronically or in person) or outside help in general are both strictly prohibited during exams, as well.

Students must have their camera and microphone turned on and pointed at them and their exam during the entirety of each exam period, in addition to obeying all other exam rules. If you are not sure whether an item is permitted, please ask me before the exam. I retain the right to issue an exam grade of zero to any student found to be in violation of one or more exam rules. Essentially, you may have a non-graphing calculator, a pen or pencil (or two), and some blank sheets of paper with you while you are taking the exam. These blank sheets of paper are for recording your answers and showing all of your work for the exam. At the end of the

exam you will scan these pages, convert them to a single PDF, and upload them to the correct submissions folder on D2L to be graded. Complete and legible solutions to each problem are necessary, but not sufficient, to earn credit.

Policies

Academic Integrity

For the Academic Integrity Policy on issues such as plagiarism, repurposing, cheating and other forms of academic dishonesty please see the University's policies page, which is available at: www.roosevelt.edu/policies. 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/current-students/get-help/learning-commons/disability-services. If you have a condition or disability that requires reasonable accommodation, please alert 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 312-341-3811. In Schaumburg, the office is in room 125, and the phone number is 847-619-7978. You can also reach the ASC by emailing academicsuccess@roosevelt.edu.

Religious Holidays

Please let your instructor know as soon as possible if you will miss class because you are observing a religious holiday. 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. The complete policy can be found here: https://www.roosevelt.edu/title-ix

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 confidential advisors on campus who are not mandated reporters. They are:

LaDonna Long (312)244-0426 – Confidential Advisor (available via phone all hours)
Toyia Stewart – Deputy Coordinator (312) 341-6756

Alice Jones - Title IX Coordinator (312) 341-2045.
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.

Withdrawal Date

The final date for an official withdrawal from this class (meaning a "W" would appear on your transcript) is **3/26/20**21. In order to withdraw after the official withdrawal date, you must petition for a late withdraw with Office of 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.

Resources for Students

Academic Advising

Advisors help students review degree options and curriculum requirements for most undergraduate programs; assist undecided students in identifying career goals and academic major; and guide students experiencing academic difficulty or academic probation.

Help students interpret University policies and procedures

Chicago campus: room 1M10, Mezzanine, Wabash Building, (312) 341-4340.

Schaumburg campus: SCH 125; (847) 619-7930

CCPA, Education, Honors and Hospitality Management students are advised in their programs. Graduate students work directly with their academic department.

Academic Success Center

Disability Services, Peer Mentor Program

Chicago campus: Auditorium Building 1050 (inside the Library) (312) 341-3818.

Schaumburg campus: room 125, 847-619-7978. Email Adam Wouk or Danielle Smith at dsmith51@roosevelt.edu.

Blackboard Support, Training and Quick Guides

The Blackboard course management system is supported by the RUOnline staff and by the Roosevelt University Help Desk.

Quick guides: http://www.roosevelt.edu/RUOnline/Students/BbTutorials.aspx
RUOnline: http://www.roosevelt.edu/RUOnline/ContactUs.aspx
Technology Help desk: https://www.roosevelt.edu/current-students/technology

Campus Safety

Auditorium Building: (312) 341-2020
Gage Building: (312) 341-3111
Schaumburg campus: (847) 619-8989

Computer Labs

A list of open labs is located here: http://www.roosevelt.edu/ITS/labs.aspx

Counseling Center

Individual counseling, as well as group and couples counseling.

> Chicago campus: room 470 Auditorium Building, (312) 341-3548
> Schaumburg campus: room 114, (312) 341-3548 https://www.roosevelt.edu/current-students/get-help/counseling-center

Financial Aid Services

Apply for financial aid, set up payment plans, and answer questions regarding your Roosevelt bill.

> Chicago campus: Mezzanine, Wabash Building, (866) 421-0935; FAO@roosevelt.edu
> Schaumburg campus: room 125, (866) 421-0935; FAO@roosevelt.edu

Food and Toiletry Pantry

If you or someone you know are in need of food or toiletries please visit the pantry located in WB318 and SCH 130 H. Students may access the pantry during the posted hours or by appointment. Appointment can be scheduled via email at HFI@roosevelt.edu. Additionally, if interested in volunteering or donating to the pantry, please e-mail HFI@roosevelt.edu.

Learning Commons

Peer tutoring in writing, math, and other subjects, in person and online.

> Chicago: 10th Floor (in the Library), Auditorium Building.
> Schaumburg: Visit SCH 125 for information on available tutoring.

Visit our webpage for more information on hours, appointments, and available services https://www.roosevelt.edu/current-students/get-help/learning-commons

Library

Find everything you need to know at http://www.roosevelt.edu/Library.aspx about the Auditorium Building library, the Schaumburg library and the Performing Arts library.

Registrar

Registration, drop/add, withdrawal, transcripts, credit evaluation, graduation.

> Chicago campus: Mezzanine floor, Wabash Building, (312) 341-3535; registrar@roosevelt.edu
> Schaumburg campus: room 125, (847) 619-7950; registrar@roosevelt.edu

RUWiFi

To access the university's wireless network, either email helpdesk@roosevelt.edu or call (312) 341-4357 for the connection key.

Tentative Schedule

An outline of the topics that will be covered in this course appears on the next page. Although I will generally follow the order of presentation found in your textbook, on occasion I will deviate from this order. Please refer to the tentative schedule below and posted reading assignments to note these deviations.

Monday	
Jan 18th Martin Luther King Jr. Day (No Class)	
25th Introduction and overview. The First Law Read Fundementals and Chapter 1	**1**
Feb 1st The Second Law Read Chapter 2 HW 1 due	**2**
8th Phase equilibria Read Chapter 3	**3**
15th Chemical equilibria Read Chapter 4 HW 2 due	**4**
22nd **Quiz 1** Ion and electron transport Read Chapter 5 HW 3 due	**5**
Mar 1st The rates of reactions Read Chapter 6	**6**
8th The rates of reactions Read Chapter 6	**7**
15th Accounting for the rate laws Read Chapter 7 HW 4 due	**8**
22nd **Exam 1**	**9**
29th Accounting for the rate laws Read Chapter 7	**10**
Apr 5th Accounting for the rate laws Complex biochemical processes Read Chapter 8 (§8.1–8.4)	**11**
12th Spring Break (No Class)	

Monday	
19th Microscopic systems and quantization Read Chapter 9 HW 5 due	**12**
26th **Quiz 2** Microscopic systems and quantization Read Chapter 9 HW 6 due	**13**
May 3rd Chemical bonding Read Chapter 10 HW 7 due Project presentations	**14**
10th **Final Exam** **8:00 AM – 10:30 AM**	**15**

Changes to this syllabus may be made when deemed appropriate.

Last updated: April 5, 2021