CAMPBELLSVILLE UNIVERSITY

COURSE SYLLABUS

PLEASE TYPE.

DATE Fall, 2010

ACADEMIC UNIT Natural Science FACULTY P. Adcock

Discipline	Course# Section	Title of Course	Credit Hours	Cross Reference (if applicable)
CHE	411	Phys. Chem. for the Life Sciences	3	

TEXTBOOK [ ] Required [ ] Not Required

Author see attached Title _____

Publisher _____ Date of Publication _____

WORKBOOK

Author _____ Title _____

Publisher _____ Date of Publication _____

PLEASE ANSWER THE FOLLOWING QUESTIONS ON A SEPARATE SHEET OF PAPER AND ATTACH TO THIS FORM.

1. DESCRIPTION OF COURSE: Develop a brief description of the course as it will appear in the Catalog.
2. COURSE OBJECTIVES: List the objectives of the course, both general and specific. Please relate these objectives to the mission and goals of the University and the Academic Unit.
3. COURSE OUTLINE: Outline the topics/units that are to be taught.
4. EVALUATION: How do you plan to determine the grade in the course. Please include grading scale.
5. REQUIREMENTS
    a. Examinations: State when tests are to be administered, including unit, mid-term, and final examinations.
    b. Reports: How many, length required, and what type (Oral, term and/or research, book critiques).
    c. Supplemental reading assignments or outside work required.
    d. Supplemental instruction aids: Audio visual aids, field trips, guest speakers, etc.
6. BOOKLIST

DEAN Mary Wilson Date Copy Received 9.14.10

VICE PRESIDENT FOR ACADEMIC AFFAIRS Date Copy Received _____

Course Syllabus
CHE 411 Physical Chemistry for the Life Sciences (3 credit hours)
Campbellsville University
Fall, 2010, T(R) 9:30am-12:15pm SSC 215

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1: Description of Course

CHE 411 is an introduction to the physical chemical principles of thermodynamics, equilibrium, and kinetics with an emphasis on application to systems of biological or biochemical interest. **Prerequisites:** CHE 342 **and** (MTH 123 or MTH 210) **or** permission of instructor; concurrent enrolment with CHE 412 (Chemistry majors).

2: Course Objectives

By the end of this course, the student will:

- Demonstrate knowledge of the foundations of chemical reactivity, equilibrium, thermodynamics, phase changes, kinetics, electrochemistry, and spectroscopic techniques.
- Apply the theory to solve relevant problems, particularly in the context of cells and bio-molecules.
- Explain how the principles of physical chemistry apply in natural phenomena observed in biological systems, as well as scientific instrumentation and devices.

3: Course Outline

Part I Fundamental aspects of thermodynamics, statistical mechanics, and biomolecules (PCLS F, 12, 1, 2; Allen 1, 8, 2, 3; H+G 1, 2).

Part II More thermodynamics, phase behavior, equilibria, acid-base reactions, redox reactions, and bioenergetics (PCLS 3-5; Allen 4-6; H+G 11).

Part III Chemical/biochemical kinetics (PCLS 6, 7, 8; Allen 7, 10; QMC 20.10).

Part IV Atomic structure, chemical bonding, protein interactions, and light in biology/medicine (PCLS 9, 10, 11, 13; Allen 9, 12, 13).

PCLS = "Physical Chemistry for the Life Sciences" by Atkins and De Paula = required text
Allen = "Biophysical Chemistry" by Allen
H+G = "Introduction to Molecular Thermodynamics"
QMC = "Quanta, Matter, and Change" by Atkins, De Paula, and Friedman (instructor book).

4: Evaluation

Item	Covering	Value	Probable Date	Guaranteed Grade Scale:	
Exam I	Part I	100 points	21 Sep		
Exam II	Part II	100 points	19 Oct	875+	A
Exam III	Part III	100 points	09 Nov	750-874	B
				625-749	C
Final Exam	Parts IV, I-III	200 points	09 Dec, 8 am	500-624	D
Homework		200 points		<500	F
Formative Assessments		100 points			
Written Summaries		200 points			
Total		1000 points			

If it is to the benefit of the student's grade, the Homework percentage may replace the lowest regular exam (I-III) score.

5: Requirements

Notice:

Campbellsville University is committed to reasonable accommodations for students who have documented physical and learning disabilities, as well as medical and emotional conditions. If you have a documented disability or condition of this nature, you may be eligible for disability services. Documentation must be from a licensed professional and current in terms of assessment. Please contact the Coordinator of Disability Services at 270-789-5192 to inquire about services.

Attendance: The attendance policy of the University will be strictly enforced in this class. *In addition to being present, students will be expected to come prepared (see below).* Any cell phones, pagers, or similar electronic devices, must be switched off during this class, except with special prior permission of the instructor. If a student is more than 15 minutes late to class (by my watch), then that student will be counted as a late arrival. **Three late arrivals** will count as a full absence. **Four** absences will be sufficient for a student to be dropped from the course with a 'WA', which counts like an 'F' in grade-point average computation. Each student is responsible for all material covered in class, whether or not the student is in attendance, so always keep up with what was done during an absence, by making an appointment to see the instructor.

Class preparation: Students should generally begin familiarization with a topic by reading at least the appropriate text sections **before class.** During class, we will usually move quickly from Allen to discussion of the details and selected exercises found in appropriate sections of PCLS. Then you will be able to begin work relevant exercises and "homework". Each class session should be followed up by re-reading of notes and texts, and completing any remaining

homework problems. For further assistance, please see Dr. Adcock outside of class time, or e-mail specific questions.

Exams: Exams I to IV will be given during regular class periods. The Final Exam (comprehensive) will be given during the regularly scheduled final exam period. The only information allowed to be used during an exam or quiz will be distributed by the instructor, and will normally be limited to a periodic table including values for fundamental constants in SI units. Unless otherwise advised, the student will need to learn mathematical formulas and equations. You may use scientific calculators but not graphing or programmable calculators (also see the section on Academic Misconduct below). Unless otherwise instructed, all exams must be taken using a ball-pen.

Written Summaries: *Unless otherwise notified, students will be expected to carry out the necessary reading prior to class, and to write a half to one page summary.* Two copies should be brought to class – one for the instructor and one for the student's personal use during class and for review / study purposes. Each good faith effort by the student will receive a check mark. At the end of semester, the number of check marks will be expressed as a percentage, for final grade calculations.

Homework: Homework will be assigned and graded for each topic covered. To avoid lost pages, all homework must be stapled when turned in, or 5% of the total possible will be deducted. For each business day the homework is turned in past the announced due date, 10% of the total possible will be lost. After a homework assignment is two weeks late, a grade of zero will be given for that assignment. At the end of the year, all homework scores will be totaled and pro-rated to 200 points for final grade computation. Because homework is a crucial part of the class, each student must work each homework problem separately. Discussions between students, **before** attempting a problem, is allowed and this will often be done during class. However, copying homework solutions from another student or any other source will be considered academic misconduct, and all students involved will receive a grade of zero for the particular problem and have their remaining grades for that assignment reduced by 50%.

Academic Misconduct: Cheating in any form will not be tolerated and will immediately result in **a grade of zero for the exam, test, quiz, or assignment concerned.** Any violations will be dealt with according to University policy. *Cheating, allowing someone to cheat, or failing to report known cases of cheating are all considered* ***academic misconduct.*** Cheating includes, but is not limited to, using "cheat sheets" on exams or tests; **copying** answers or any part of an exam, test, or quiz; **any attempt to present the work of another as your own**; discussing the content or degree of difficulty of quizzes, tests, or exams with anyone before the entire class has completed the requirement; collaborating on assignments which are of an individual nature; **plagiarism** of primary or secondary sources of information; using calculators or other devices to store and/or recall prohibited information for a test or exam. Any student who refuses to allow a calculator to be inspected by the instructor upon request will not be allowed to use that calculator on the exam.

6: Book List

Required:

Physical Chemistry for the Life Sciences, 1st edition by Atkins and De Paula, Freeman-Oxford (2006). ISBN 978-0-7167-8628-3.

Recommended for further reading:

Biophysical Chemistry, 1st edition by Allen, Wiley-Blackwell (2008). ISBN 978-1-4051-2436-2.

Introduction to Molecular Thermodynamics, by Hanson and Green, University Science Books, (2008). ISBN 978-1-8913-8949-8.