

## BCUSP 162 : General Chemistry III (Chem 162) Course Syllabus-Spring 2008

**Instructor:** Charles F. Jackels  
**Office:** Rooms: 312-UW2 and 360D-UW1  
**Office Phone:** (425) 352-5368  
**E-Mail:** jackels@u.washington.edu  
**FAX:** (425) 352-5216

**Office Hours:** Tuesdays, Thursdays (11 AM-12 noon, in room 312-UW2), and by appointment. It is best to check with me ahead of time, even for a visit during normal office hours, especially if you are making a special trip for that purpose. I am in one of my offices for considerable periods every day (approximately 8-5) and will be glad to make appointments outside of the nominal office hours.

**Lab Instructor:** Heather Price, [hprice@u.washington.edu](mailto:hprice@u.washington.edu). *Detailed contact information will be provided at lab class.*

**Class Times:** a) 8:45-10:50 AM, Tuesdays and Thursdays, Room UW1-060  
b) 9:00 – 11:50 AM, Fridays, Room CC1-330  
(*on designated Fridays, 9:00-11:00 AM, UW1-060*)

**Prerequisite:** Completion of BCUSP 152 or equivalent with grade of 1.7 or better.

**Mid Term Exams:** April 22, in class  
May 20, in class

**Final Exam:** June 10, in class

**Research Assignments:** Due dates in Research Assignment handout.

**Required Texts:**

- “Chemical Principles”, Steven S. Zumdahl, (Houghton Mifflin, Boston, 2005)
- “Foundations of Chemistry”, David M. Hanson, (Pacific Crest, Lisle [IL], 2007)

**Reserve Material:** The text book and student study guides are on the course reserve shelf in the library. From time to time, journal articles and book chapters may be included as required reading in the course. They will be available on electronic reserve.

## Course Description

### BCUSP 162 – General chemistry III

(Charles F. Jackels)

This course is the third of a three-quarter sequence in Chemistry intended for students majoring in the sciences or engineering. The course covers: Molecular bonding, chemical kinetics, liquids and solids, properties of solutions, descriptive chemistry of the representative elements, transition metals and coordination chemistry, and organic chemistry. Includes a laboratory.

### Specific Course Goals

1. To gain competence with the basic fundamental chemistry concepts integral to understanding molecular bonding, chemical kinetics and the properties of liquids, solids, and solutions.
2. To gain an understanding of the descriptive chemistry of the representative groups of the periodic table.
3. To gain an understanding of the concepts of transition metal and coordination chemistry as well that of organic polymers and biomolecules.
4. To demonstrate critical reading, quantitative and statistical reasoning, and analytical thinking skills necessary to understand the claims made in the context of a scientific question..
5. To develop the written and oral communication skills necessary to effectively communicate ideas in the context of a scientific question.

**Study Groups/Research Clusters.** You will be divided by the instructor into study groups of several students each. These groups will be the basis for discussions and active learning exercises both in class and out of class, for group research activity, homework study groups, and peer writing groups. The group may also be called upon to make presentations in class. *Some of this group interaction and peer review of your papers will be accomplished electronically.*

**Research Assignments.** There will be an individual research/writing/presentation assignment involving a 750-word paper and 10 minute presentation. There will be intermediate due dates throughout the term, but the final paper and presentation will be during the last week of classes. Details will follow in the assignment handout.

### Class Participation, Homework and Workgroup Problems.

Significant class time will be spent in discussion, active learning, and student presentation mode. Students or workgroups will be contributing to and leading discussions of the material we have read. Students will be graded based on their participation in these class discussions as well as follow-up questions to be done after class. *If you are missing from class, you cannot make up the participation grade.*

There will be graded homework problem assignments given during the term. They may take the form of short answers or quantitative exercises. Generally, these will be individual efforts, but ones that permit consultation with your work group. The detail and extent of grading will vary from week to week, depending on the time available. *In some cases, the homeworks will be turned in electronically.*

**Back-up Copies.** You are responsible for maintaining back-up copies of all assignments. If an assignment should be lost or misplaced during the submission or grading process, it is your responsibility to provide a copy of that assignment upon request. Always maintain current backup copies of all of your work. Computer crashes do not qualify as “emergencies” in this class.

**Activity Workbooks.** You will use the workbook by Hanson and supplements furnished by the instructor to carry out active learning exercises in many of our classes. The supplements are to be included with the workbooks and will be checked periodically for completeness.

**Exams.** The two mid-term examinations will each be based upon approximately one-third of the course material. The final exam will be cumulative, but with an emphasis on the last third of the course. The exams may be mixtures of quantitative problems, short answer questions and short essay questions. The exams are likely to be given in a computer lab room, with the option of taking them electronically or by hand. Because of the nature of the problems, students are likely to do some problems by hand and answer others using the word processor. Therefore, you need to have three standard examination books (green or blue books from the book store). **Buy them ahead of time, so that you do not have to waste your exam time going to the book store! You may hand in any combination of hand-written exam book and computer printed pages.** A calculator may be needed for the exams. You should arrange to borrow one if you do not have one already. *You will be allowed to bring in one page of equations, constants, etc., to be used during the exams and handed in along with them.*

**Classroom Rules.** These basic rules, in addition to the requirements of the UWB Handbook, apply to the instructor and all students at all times in the classroom. If you cannot observe them at any time, you are expected to leave the classroom:

- No use of computers for web surfing, e-mail, or any other activities not directly related to class.
- No headphones, blue tooth earphones, etc in the classroom.
- No cell-phone calls, rings, musical interludes, etc., during class.
- All views are to be heard and engaged respectfully. As scholars, we are expected to analyze subject matter critically and express reasonable positions that are based on logic and fact rather than on emotion. **In no case are *ad hominem* arguments permitted in BCUSP 162.**

**Attendance: Class & Exams.** Any excuse for missing an exam *other than illness or family emergency* must be cleared with me at least one week ahead of time. If you cannot attend class on an exam day because of illness or emergency, you are expected **before class** to contact me by phone, leave a voice mail message, leave a message for me with the Computing and Software Systems office, or leave me an e-mail message. Failure to notify me in one of these ways may result in you not receiving consideration for a make-up examination.

Regular class attendance is expected, although roll calls will not be generally taken. If you are not present to participate in class discussion, active learning exercise, work group discussion and/or presentation of a “homework” exercise, that will, of course, profoundly affect your grade on that assignment. Missed in-class work (for whatever reason) *cannot* be made up.

**Late Assignments.** Assignments with due dates will not be accepted late, *unless otherwise noted in the assignment instructions*. If you are out of town on an assignment due date, it is your responsibility to arrange for internet access and submit the assignment electronically or to submit it before you leave.

**Laboratory.** The laboratory portion of the course is required. You must obtain a passing grade in the lab portion in order to pass the course. Make-up labs are extremely difficult due to lab scheduling and conflicts with other classes. Therefore, unless you have a doctor’s note, makeup labs will not be allowed. The lab course cannot be passed with more than one missing lab. Labs will take place on Fridays and are presently scheduled (see below) on six or seven of the Fridays during the term. (Class/workshops will meet on the other Fridays.) In order to complete the lab in the allotted amount of time, and for safety reasons, you must arrive on time and come fully prepared to conduct the lab. Before every lab class you must read all materials provided and pass an on-line quiz with a score of 90% or better. You will not be allowed to perform the lab until you have passed the on-line quiz. All information and data for labs must be recorded in a laboratory notebook with numbered, duplicate sheets. You are also required to obtain and wear lab goggles in the lab at all times. Blackboard will be used by the lab course. The prelab quizzes are taken on Blackboard: <http://blackboard.uwb.edu/>

### **Documented Disabilities**

If you believe that you have a disability and would like academic accommodations, please contact Disability Support Services at 425.352.5307 or at [rlundborg@uwb.edu](mailto:rlundborg@uwb.edu). After an initial intake appointment, you should be prepared to provide documentation of your disability in order to receive assistance.

## Academic Honesty

The highest standards of academic honesty will be expected in this class. Cheating and plagiarism in any of their forms are unacceptable. At the least, a grade of zero will be assigned to any work that is the product of cheating or plagiarism. Plagiarism is also discussed in the 1993-1995 UW Bothell Catalog:

"Plagiarism is the use of the creations, ideas or words of someone else without formally acknowledging the author or source through appropriate use of quotation marks, references, and the like. Plagiarizing is stealing someone's work and presenting it as one's own original work or thought. Student work in which plagiarism occurs will not ordinarily be accepted as satisfactory by the instructor, and may lead to disciplinary action against the student submitting it. Any student who is uncertain whether his or her use of the work of others constitutes plagiarism should consult the course instructor for guidance before formally submitting the course work involved."

Work that is assigned to you alone is to be assisted by no one else. When collaboration on homework is permitted, that fact will be made explicit. Assume that all assignments are to be individual work unless I indicate otherwise. The official UWB information on academic integrity is to be found at <http://www.uwb.edu/students/policies/integrity.html>. Each student is responsible to read and understand that information. *It is your responsibility to clarify with me any uncertainty that may exist on this question. Do not assume that an action is acceptable; ask me to be sure.*

Work turned in for this course may be subject to electronic checking for plagiarism.

## Grades.

The final grade will be determined numerically by averaging your scores with the following weights:

Final Exam	20%	Homework Assignments	12%
Midterm Exams (total for two)	30%	Research Report	10%
Labs	18%		
Class and work group participation	10%		

Most grades given during the course of the term will be based on a 100-pt scale. The **official decimal class grades** (0.0 - 4.0) will be determined from a weighted average of your individual grades. A weighted average of 96 will be assigned a decimal grade of 4.0, and a weighted grade of 55 will be assigned a decimal grade of 0.7. Intermediate grades will be determined by a linear relationship between these two limits. This scale represents a *minimum* decimal grade. If I judge it to be appropriate, I will give higher

grades than those indicated by this scale. Based on experience, the class GPA will likely fall in the range 2.7-3.0 (a “B” average).

The following table represents the official UW conversion of standard letter grades to the UW decimal grade scale and the conversion to the 100-pt scale used in this class:

	A Range		B Range			C Range			D Range		
Letter	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
Min Decimal	3.9	3.5	3.2	2.9	2.5	2.2	1.9	1.5	1.2	0.9	0.7
Min 100-pt	95	90	86	82	77	74	70	65	61	57	55

### Library Materials:

There is a link on the course home page that connects to the library reserve catalog. Many useful reference materials are to be found in one of the UW libraries on the UWS campus rather than at UWB. These can be obtained with little effort via electronic document delivery or the courier service. Make sure you know how to use this service.

### Use of E-Mail

You will be required to use e-mail as part of this course. Since our personal contact hours are quite limited, this will be a major avenue for our communication. In addition, I will use the class e-mail list, listserv, and web page as means of broadcasting information to the class. It is assumed that class members are reading their e-mail on a daily basis. You may, of course, read your e-mail anywhere of your choosing, but it is required that you will have an active account of the form [UWNetID@u.washington.edu](mailto:UWNetID@u.washington.edu) that you check or forward daily. You can set up your account from the UW Web page. There is also a link on our course home page that takes you to UW on-line documentation that explains how to set up an account, how to send e-mail, etc.

There is a web-based U-mail form set up that allows you to send me either identified or anonymous e-mail from the browser. It can be found at URL: <https://catalysttools.washington.edu/umail/form/jackels/2790> and there are links to this Umail form on the course home page.

### Class Listproc

A listserv has been set up for the class. Any message or reply sent to this address is rebroadcast to the entire class. You are welcome to use this when you want to communicate with the entire class. Your UWNetID e-mail account is automatically subscribed to this listproc. The e-mail address for this is: [bcusp162a\\_sp08@u.washington.edu](mailto:bcusp162a_sp08@u.washington.edu)

Note the single underscore between "bcusp116a" and "w08"; it is required.

## Use of Class Discussion Board

I have set up a computer discussion board for our use. This is an excellent medium for class discussions. Any class member can post to the bulletin board. It forms a "running" conversation that can be about the lectures, problem assignments, etc. I am using E-Post for this purpose. The bulletin board is found at:

<https://catalysttools.washington.edu/gopost/board/jackels/5378/>

A link to this bulletin board will appear on the course web site. When you first access this message board, you will establish a username and password. You can also click on "configure" in order to select the type of e-mail notification to be provided. You can be automatically notified when someone has posted a message to the board.

## Electronic Submission of Assignments

Most assignments for this course will be submitted partially or entirely electronically.

The Catalyst drop-box site for homeworks is found at:

<https://catalysttools.washington.edu/collectit/dropbox/jackels/2106>

The Catalyst drop-box site for the research/writing assignment is found at:

<https://catalysttools.washington.edu/collectit/dropbox/jackels/2107>

## Peer Review Site

To assist in peer review of your research reports and their preliminary submissions, a peer review site has been set up for the class. We will discuss in class how to use it. It is to be found at:

<http://catalyst.washington.edu/webtools/pr/slogin.cgi?owner=jackels&id=4424>

## Course Home Page

My personal home page is found at the URL:

<http://faculty.washington.edu/jackels>

Click on the entry referring to this course and you will find yourself at the course home page: <http://faculty.washington.edu/jackels/bcusp162.s08>

**Laboratory Blackboard Site (prelab quizzes, etc):** <http://blackboard.uwb.edu/>

**Tentative Class Schedule (subject to change)**

DATE	READING	TOPICS
Apr 1	Z:Ch 13.1-13.4; SA's1 &2	Chemical Bonding – general concepts
Apr 3	H:21, Z: 13.6-13.10	Continued
Apr 4	H: 22, Z 13.11-13	Continued -No Lab – Class meets in UW1-060 (9-11)
Apr 8	Z:Ch 14; H:23	Chemical Bonding – Molecular Orbitals and Spectroscopy
Apr 10	H:24	Continued
Apr 11		Lab 1 : Molecular Models and FTIR
Apr 15	H:25	Continued
Apr 17	Z: Ch 15; H:28	Chemical Kinetics
Apr 18	H: 29;	No Lab – Class meets in UW1-060 (9-11)
Apr 22	Review	<b>EXAM 1 (chs 13-14)</b>
Apr 24	H:30	Continued – Kinetics
Apr 25		Lab 2: Chemical Kinetics
Apr 29	Z: Ch 16; H:13	Liquids and solids
May 1		Continued
May 2		Lab 3: Vapor Pressure of Water
May 6	Z: Ch 17	Solutions
May 8		Continued
May 9		Lab 4: Solubility and Fractional Crystallization
May 13	Z: Ch 22	Organic Chem and Biochemistry
May 15	H:44; H:45	Continued
May 16		Lab 5: Freezing Point Depression
May 20	Review	<b>EXAM 2 (chs 15-17)</b>
May 22		Continued
May 23		Lab 6: Salicylic Acid Synthesis
May 27	Z: Ch 18	Descriptive Chemistry: Groups 1-
May 29	Z: Ch 19	Descriptive Chemistry: Groups 5-8
May 30	Z: Ch 20; H:41	Transition Metals/Coordination Chemistry -No Lab – Class meets in UW1-060 (9-11)
Jun 3	H:42;	continued
Jun 5	H:43	continued
Jun 6		Class meets in UW1-060 (9-11) Class Presentations
Jun 10	{review}	<b>Final Exam</b>

Date	Hwk	Writing Assignment	Other
Apr 4	Homework #0 (Test Assgt)	<b>Research/ writing assignments will follow.</b>	Class Survey
Apr 11	Homework #1		
Apr 18	Homework #2		
Apr 25	Homework #3		
May 2	Homework #4		
May 9	Homework #5		
May 16	Homework #6		
May 23	Homework #7		
May 30	Homework #8		
Jun 6			

The electronic portions of these assignments are to be turned in electronically before 12 noon on the day shown. Problems done in hard copy format are due in my mail box in UW1-360 before 12 noon on the day shown. Drop boxes have been set up at the course turn-in site:

<https://catalysttools.washington.edu/collectit/dropbox/jackels/2106>