Chemistry 104: A Survey Of Organic Chemistry And Biochemistry
(4.0 Credits) Spring Semester, 2009

Instructor:	Dr. Marina R. Castillo
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Class Meetings:	Tuesday and Thursday, 11:30 AM – 1:00 PM, NSF 202
Office Hours:	Daily, 1:00 – 3:00 PM

Prerequisites: CHEM 103 or equivalent or permission of instructor.

Course Readings / Materials: The required **text book** is: "Introduction to General, Organic and Biochemistry" 8th edition (authors Bettelheim, Brown, Campbell, and Farrel).
A recommended student **solutions manual** accompanies the textbook.
The **lab manual**, entitled "Experiments in General Chemistry 104: A Laboratory Manual", should be included with the text book in the campus bookstore and is required.
A hand-held, radio frequency **clicker** is also required for this course. Students may purchase the clicker with the text book or separately from the book store.
An **OWL pin number** is also required for this course. This pin number may be purchased at the UAF book store with the text book or separately.
Finally, a non-programmable **calculator**, capable of scientific notation (example: Sharp EL-501WB-BK or equivalent), is also required for this course.

Course Overview: Chemistry 104 (4.0 credit course), is the second semester of a two semester series in general chemistry. The course will cover in basic detail the chemistry/biochemistry of basic building blocks such as proteins, nucleic acids, carbohydrates and proteins. We will cover chapters 10, 20 to 23, and 25 to 27 of the text "Introduction to General, Organic and Biochemistry" 8th edition (authors Bettelheim, Brown, Campbell, and Farrel).

Course Goals and Student Learning Outcomes: As a result of the Chem 104 experience, students will become familiar with proteins, nucleic acids, carbohydrates and proteins and will relate these topics to everyday living as well as health issues. Students will practice the scientific method and learn basic skills in laboratory practices.

Chem 104 Homepage (Blackboard): Log into https://classes.uaf.edu then select Beginnings in Biochemistry and go to course documents. The contents include the syllabus, lecture schedule, lecture presentations and handouts.

Instructor's Expectations of Students: Each day BEFORE class, the student must read the portion of the text book that is assigned on the schedule of reading assignments included with this syllabus. During lecture, students will have opportunities to participate by solving in-class problems.

Exams: Three one-hour exams and a final exam will be given. All four exams count equally toward the course grade. The final exam is cumulative. Help sheets during examinations including the final exam are not allowed!!!.
Make-up exams will be allowed for good reasons. If you can anticipate an absence (work commitments, intercollegiate sports, etc.), talk to your professor ***before*** the exam to make arrangements. If the absence is unexpected (illness, family or personal difficulties, cold weather transportation), talk with your professor at the earliest possible opportunity. Please reschedule an exam if you are ill. If you are to take a makeup exam, we expect that you have no substantial knowledge of the content of the original exam. If you have found out about the exam content, you are obligated to tell this to your professor well before the scheduled time of the makeup exam.

OWL Homework: Homework problems will be done using the OWL (On-line Web-based Learning) system, developed at the University of Massachusetts Amherst. Access to OWL can be accomplished by going to the homepage for the Chemistry Department.
Instructions for using the OWL system will be given at the end of the first day of lecture. Your login name is your last name. Your password is your student ID number. On your first visit, you should change your password to something more private. Do this by clicking on the Contact Info button on the left menu bar.
Students will be given seven chances to solve each OWL homework problem.
Because of the large size of some of the files, the best place to work with OWL is at a terminal with high speed internet access, such as any of the public terminals on campus (go to www.uaf.edu/DCC/labs/ for information). Working through a modem requires patience. Some of the materials are in ".pdf" format and require the Adobe Acrobat reader, a free plug-in.
If you send an email to the OWL system and if you desire a return email from Prof. Castillo, include your name and email address in the body of the message. The OWL administrators may have this information, but I do not.

In Class Participation: During lecture, at least two graded questions will be given. Each question is worth 2 points: 2 points for a correct answer, 1 point for an incorrect answer, and 0 points for no answer. All clicker devices must be registered with Dr. Castillo by Jan 30. It is a requirement for this class to have a clicker. Questions will pertain to material in the reading assignment and covered in lecture. *Lecture hour will be conducted with the assumption that you have done some reading and active learning prior to class time*. Some students may desire more practice problems in order to gain a better understanding of the material. For more practice, students should see Professor Castillo during office hours. Professor Castillo will help the students with back-of-the-chapter problems.

Laboratory: The purpose of the lab is to do hands-on investigation. We expect you to gain skills in scientific reasoning, experimental design, and use of chemicals and laboratory apparatus. The labs are conducted by graduate and upper division undergraduate teaching assistants who will have specific office hours. Lab reports will be handed in each week, to be graded and returned by the teaching assistant. Eleven experiments are scheduled for the semester. The laboratory portion of your grade (100 points) will be based upon the average of your best ten lab grades.
With one exception (see below), *all students enrolled in Chem 104 must attend laboratory*. Students completing reports for fewer than eight labs will fail the course, even if they have passing exam grades. You must attend lab prior to writing a lab report! There are no make-up

labs scheduled during the semester. If you have special scheduling problems or if you miss more than one lab for an acceptable reason, please discuss alternative plans with Professor Castillo.
Laboratory reports are due one week after a lab is completed. Reports will be accepted up to one week late, but they will earn only 75% of the assigned grade. Reports turned in more than one week late will not be accepted. The last report of the semester will not be accepted late.
No lab work will be carried out during the first week of class. The first lab work occurs during the second week of class and includes a safety review. STUDENTS MUST ATTEND THE SAFETY REVIEW IN ORDER TO STAY IN THIS COURSE!
Please see the portion of the UAF Honor Code reproduced in the "Ethical Considerations" section below. Do not believe any rumors that it is acceptable to make up data or to use the work of another student (other than a lab partner in a collaborative experiment) as the basis of a lab report.

Help: There are actually a large number of sources of help, in case the student is having difficulty with Chem 104. The student may make an appointment to see Prof. Castillo for help. Or, the Chemistry Department offers free tutoring services, and the student may see a tutor for help. The student may see any lab TA for help during the TA's office hours.

Ethical Considerations: The Chemistry "Department Policy on Cheating" is this: "*Any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course*."
Examples of cheating include, but is not limited to, the following: (1) Copying another student's answer while taking a quiz or exam; (2) Copying another student's answer while answering an in-class question with the clicker, unless given permission by the instructor to do so; (3) Using another student's clicker for any reason; (4) Using another student's work while writing lab reports, unless given permission to do so.

If you misplace your clicker, immediately notify Professor Castillo. You must buy a new clicker.

Using another student's clicker is strictly prohibited. If a student is caught using another student's clicker, both the borrower and the lender will be considered cheaters and will be subjected to the policies on cheating.
Calculators may be used for numerical calculations only. Plan to use a non-programmable calculator for exams. Using qualitative chemical information or quantitative examples preprogrammed on a calculator is not allowed during exams. Prof. Castillo reserves the right to give you a simple calculator if you bring a programmable device with you for an exam. Feel free to discuss this on an individual basis with Prof. Castillo, well before exam time.
As a UAF student, you are subject to UAF's Honor Code:

"Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.
Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports.
No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.
Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion."

Disabilities: Students with a physical or learning disability are required to identify themselves to Mary Matthews (x 7043) in the Disability Services office, located in the Center for Health and Counseling. The student must provide documentation of the disability. Disability Services will then notify Prof. Castillo of special arrangements for taking tests, working homework assignments, and doing lab work.

Tentative Grade Scale:

Criterion	**Maximum Point Value**
Examination 1	100
Examination 2	100
Examination 3	100
Final Examination	100
OWL Homework	100
Lab Reports	100
In-Class Participation	100
Total	**700**

Range of Points	**Letter Grade**
700 – 630	A
629 – 560	B
559 – 490	C
489 – 420	D
419 or less	F

Note: Plus/minus letter grade system will not be used for grading

Instructor Drops and Withdrawals: The instructor reserves the right to drop any student from class if that student has missed an exam without an excused absence, has missed more than two labs, appears to be failing as of February 6, 2009 (course will not appear on academic record), or has many "zeros" for class participation grades. Professor Castillo will notify the student one time before dropping the student from class. If the student corrects the deficiency, the student may remain in this class; otherwise the student will be dropped. The last day for instructor withdrawal is March 27, 2009 (W grade appears on academic record).

Freshman Progress Reports: Progress reports for freshman students are due to the Registrar's Office by February 27, 2009. The grade reported at that time will be based on the student's scores on Examination 1, OWL Ch10 and OWL Ch22 and 23, and the in-class participation grade as of February 24, 2009.

Incompletes: A grade of "incomplete" is assigned only when a student misses the final exam for a very good reason, such as a medical problem, a death in the family, etc.

Withdrawal Dates: Please keep the following dates in mind.

Last day to drop class and get 100% refund	January 30
Last day to drop class and get 50% refund	February 6
Freshmen reports due	February 27
Last day for class withdrawal	March 27

See academic calendar on inside cover of 2008-2009 course catalog for more important dates.

Date	Day	Chapter / Pages		Lecture	Homework	Demo	Lab Experiment
1/22/2009	Th			Syllabus and Introduction	**OWL 10**		
1/27/2009	T	10	285-297	Organic chemistry	Due 2/1/09		Chemical health and safety
1/29/2009	Th	22	551-560	Proteins	**OWL 22**		Mandatory attendance!!!
2/3/2009	T	22	561-569	Function of proteins	Due 2/12/09		Discovery Lab
2/5/2009	Th	22	570-573	Primary and Secondary structure			Amino acid structure
2/10/2009	T	22	574-579	Tertiary and Quaternary structure		Protein	Separation of amino acids
2/12/2009	Th	23	584-593	Enzymes	**OWL 23**	electrophoresis	by paper chromatography
2/17/2009	T	23	594-602	Function and regulation of enzymes	Due 2/18/09	Denaturation	Isolation and identification
2/19/2009	Th			**EXAM 1**			of casein
2/24/2009	T	25	632-642	DNA and RNA structure	**OWL 25**		Kinetics of urease
2/26/2009	Th	25	643-654	RNA role, DNA replication and repair	Due 3/4/09		
3/3/2009	T	25	655-657	DNA amplification		DNA	ELISA assay
3/5/2009	Th	26	661-673	Gene expression	**OWL 26**	electrophoresis	
				SPRING BREAK WEEK			
3/17/2009	T	26	674-682	Gene regulation	Due 3/23/09		Isolation and identification
3/19/2009	Th	26	683-688	Mutations and gene therapy			of DNA from onion
3/24/2009	T			**EXAM 2**			
3/26/2009	Th	20	493-503	Carbohydrates	**OWL 20**		**No Lab this week**
3/31/2009	T	20	504-515	Reactions, di- oligo- poly saccharides,	Due 4/5/09		Carbohydrates
4/2/2009	Th	21	521-525	Lipids and their role in membranes	**OWL 21**		
4/7/2009	T	21	525-530	Complex lipids	Due 4/15/09		Blood typing
4/9/2009	Th	21	530-538	Sphingolipids, glycolipids, steroids			
4/14/2009	T	21	539-546	Physiological roles of steroids			Preparation and properties
4/16/2009	Th			**EXAM 3**			of soap
4/21/2009	T	27	692-698	Bioenergetics, metabolic pathways	**OWL 27**		Analysis of lipids
4/23/2009	Th	27	699-704	Krebs cycle and Ox. phosphorylation	Due 4/30/09		
4/28/2009	T	27	704-709	Energy yield and conversion/uses			Adrenoleukodistropy
4/30/2009	Th			**REVIEW**			
5/9/2009	Sat	**FINAL EXAM**		Saturday 10:15 am to 12:15 pm			