

## Chemistry 104X: A Survey of Organic Chemistry and Biochemistry Spring 2018 Course Syllabus

Instructor:	Dr. Maegan Weltzin	Lecture Period:	MWF 3:30 - 4:30pm
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Phone:	474-5627		

### Course materials

The following materials are *required* for the course and can be purchased in the UAF bookstore or elsewhere:

- Introduction To General, Organic, and Biochemistry 11th Ed. by Bettelheim, Brown, Campbell, Farrell and Torres (ISBN-13: 978-1-285-86975-9)
- OWLv2 Cengage Learning access for Introduction To General, Organic, and Biochemistry 11th Ed by Bettelheim.
- TurningPoint Technologies Response – See Blackboard for registration instructions
- Experiments in Survey of Org Chem & Biochem Chemistry 104X: A Laboratory Manual (free! Handouts can be printed from Blackboard, updated weekly)
- A non-programmable, non-graphing scientific calculator is required for each exam. The Department of Chemistry and Biochemistry does not provide calculators for exams, the student *must* provide their own. A \$10 calculator will meet the needs of this course as long as it has standard arithmetic keys as well as 10x, LOG, EXP or ex, LN and xy functions.
- A University of Alaska email address is required for all communication in the class. This also provides access to the Blackboard system for individual scores and grades.

The following materials are *optional* and may assist the student in their studies:

- Student Solutions Manual for Introduction To General, Organic, and Biochemistry 11th Ed

### Important UAF Dates

Last day for student- and faculty-initiated drops with refund (course does not appear on academic record)	Friday, Jan. 26
Spring break (no classes)	Monday-Friday, March 12-16
Fall 2018 course list available at UAOnline	Monday, March 19
Last day for student- and faculty-initiated withdrawals (W grade appears on academic transcript)	Friday, March 30

Begin registration and fee payment for fall 2018 semester (degree students)

Monday, April 2

### **Who should take this course?**

The course is intended for students who are interested in enriching their lives with chemistry and biochemistry. This course bridges the gap between a general chemistry course and biochemical concepts of health-related sciences. The course is recommended for health-science degree candidates and non-science majors interested in the central role of biochemistry in life.

**Course Goals:** Structure and function is a recurrent theme in the course; molecular shape determines function. Students who successfully complete this course will have an understanding of the structure and function of molecules that are the building blocks of living systems. Students will develop an appreciation for the relationship between the unique physical and chemical properties of the major classes of biological macromolecules (proteins, lipids, carbohydrates and nucleic acids) and their particular functional roles. Armed with an understanding of the biochemical principles of living systems, students will be more informed consumers and be better prepared to contemplate the relationship between public science policy and human health.

**Prerequisites:** Chem F103X, placement in ENGL F111X of higher, placement in DEVM F105 or higher, or permission of instructor.

### **Course expectations and outcomes**

Students are expected to attend class; attendance will be monitored from in class clicker responses. Each day *before* class the student should read and digest the portion of the textbook appropriate as per the class schedule. *Active learning* involves the student using their sensory motor cortex (sight, smell, sound, taste and touch) in addition to their intelligence, to solidify through practice a concept the student has just read or heard about. Supplementing the course catalog, the course goals are to continue build the student's skills solving biochemistry problems, reading critically, formulating questions, completing laboratory experiments and communicating information assimilated throughout the course by completing exams. Class conduct should be professional as well as respectful of the rights other students to constructive learning experience.

**Blackboard:** <https://classes.uaf.edu>. Course information, supporting documents and grades for this course will be maintained on the UAF Blackboard website. Time sensitive information and reminders will be sent occasionally to all students enrolled in the course using blackboard, so it is important that you verify that your email address is correct and current.

**Preparation:** It is *strongly* recommended that each student read the portion of the textbook that corresponds to the lecture, before the class begins (see course calendar).

**Cell phones/Computers:** Use of electronic devices that facilitate learning are permitted. Any other use is prohibited. If you talk on the phone you will be asked to bring treats for everyone the next class. Mobile devices are not allowed during exams.

## Grading

Grades will be posted to Blackboard, which can be accessed from the UAF homepage. Class grades may be adjusted (curved) from the following schedule only in the students' favor.

	Points	Grade Range	Letter Grade	Points
Examination 1	100	100 - 90%	A	1000-900
Examination 2	100	89 - 80%	B	899-800
Examination 3	100	79 - 70%	C	799-700
Final Examination	110	69 - 60%	D	699-600
Quizzes	90	59% or less	F	< 600
Lab	250			
Homework	140			
Participation and Clicker	40			
Final Presentation	70			
Total	1000			

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 Friday, March 30, 2018, or has many zeros for class participation grades. Students will be notified once via email before the drop; if the student corrects the deficiency, the student may remain in this class. Progress reports for freshman students are due to the Registrar's Office by Monday, Feb. 26, 2018. The grade reported at that time will include the student's scores on the first exam, homework, quizzes and the in-class participation grade. The last day for instructor initiated withdrawal is Friday, March 30, 2018 (W grade appears on academic record). An incomplete grade will only be assigned if a student misses the final exam for an outstanding reason, such as a medical problem, a death in the family, etc.

## Homework

Homework problems will be assigned using questions from the textbook in coordination with the OWLv2 Cengage Learning program. Students should expect between 2 - 3 hours of homework to be assigned each week. Each homework assignment will have at least two links in the homework folder for that week on Blackboard. Each link contains a different problem set, so you must complete the exercises in all the links to get full credit. Homework assignments for the week will be due according to the course schedule below no later than 3pm. It is recommended that students promptly register and log in to OWLv2 Cengage Learning as homework will be assigned within the first class period. You will need your access code that came with your book. If you do not have one anymore, please see me.

\* Occasionally, students experience problems using OWLv2. For example, students may type in a right answer, but OWLv2 will count their answer as wrong. Or, perhaps a student cannot open OWLv2 on his or her particular laptop for some unknown reason. If a student experiences any "electronic" problems using OWLv2, the student must contact Cengage at **1-800-354-9706** or email **support.cengage.com** for help. The Cengage technicians are usually able to resolve the problem. However, if the problem is still not resolved, then the student should contact Dr. Weltzin with the case number given by the Cengage technician. Dr. Weltzin will then notify the Cengage sales team of the problem and give them the case number so that the problem can be resolved.

**Final Projects:** At the end of the semester students will prepare and present a group final project. These projects are intended to connect core concepts learned in class to everyday life. Students will pick a topic of interest from class (such as i.e. the citric acid cycle, beta oxidation, DNA transcription, protein function, etc.), describe the topic in an interesting and meaningful way, discuss diseases associated with this topic including treatment strategies. These projects are intended to spur your creativity while also helping you to review for the final and to learn something new.

**Late assignments** are not accepted. Students are given up to a week to complete assignments, which are scheduled to coordinate with lectures and exams.

### Quizzes/Worksheets

**Each student must obtain a radio frequency clicker (see above) or download the Turning Technologies app**, which is used in lecture to answer questions projected on the overhead. Either option can be used but students must purchase a Cloud registration code. Clicker numbers *must* be registered online in the Blackboard system to receive grades, as responses are recorded electronically by the TurningPoint receiver and software on the classroom computer. No answers on paper will be accepted unless specified; any student found using any clicker other than their own will be in violation of the UAF honor code (see below). The quiz questions are likely to be similar to assigned homework problems and are designed to help prepare you for exams. Students should come prepared to class with any materials needed for the quizzes, as the quizzes are open book, open note and require a calculator. However, sharing of class materials will not be permitted. Quizzes will occur every Friday as indicated on the course schedule. Quizzes will consist of 5 questions worth a total of 10 points, 3 minutes for each question. Answers will be collected through the use of clickers. A total of 10 quizzes will be given throughout the semester and the highest 9 scores will be tabulated (dropping lowest score). If a student knows that they will be missing a quiz, then that student should see Dr. Weltzin about making up the quiz before the missed assignment. Dr. Weltzin will assign textbook problems similar to the quiz problems to the student and the student must solve the problem immediately on a sheet of paper and turn in the answer. The student will receive points if and only if the answers are correct.

### Laboratory

The purpose of lab is to perform hands-on investigation of chemical principles and theories. Students will gain skills in scientific reasoning, experimental design, and use of chemicals as well as laboratory apparatus. Laboratory procedures will be available for printing on blackboard before the start of the lab section. Small group learning assignments will also accompany laboratory and account for a portion of the lab grade. Lab reports must be turned in the following week to be graded by the laboratory assistant, attendance in lab is *mandatory* for report credit. The laboratory portion of the student's grade will be based upon the average of the student's best 10 lab reports. Students may miss two labs with no impact on their lab grade; lack of attendance or failure to complete 9 laboratories will result in a *failing* grade for the course. If the student has special scheduling problems please discuss alternative options with Emily Reiter, Laboratory Director. Late reports may be accepted with penalized scores, excluding the last report of the semester, which will not be accepted late.

### Exams

The student is responsible for all information from text, lecture, homework, quizzes and assigned study questions. Any of these sources will be used to construct exam questions. No

use of a cell phone, pda, graphing calculator or otherwise will be allowed during the exam. Three one-hour exams and a cumulative final exam will be given as per the course schedule. The final exam will on May 2 from 3:15 – 5:15 and will be cumulative.

### **Absences**

Make up examinations at Testing Services will be allowed for legitimate absences only, an unexplained absence from an exam results in a zero. If the student anticipates an absence (intercollegiate sports, travel for military or university business), the student must talk to Dr. Weltzin ***before*** the exam. If the absence is unexpected (illness, family or personal calamity), contact the professor at the earliest possible opportunity. Please note that makeup exams require the student to have *no* knowledge of the original exam. No extensions, makeup or late work will be accepted otherwise, however homework grades will receive a buffer for any missed assignments to be utilized by the student at their discretion.

### **Ethical considerations**

The Chemistry and Biochemistry Department *Policy on Cheating* states:

*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 are not limited to:

- Copying another student's answer while taking a quiz or exam
- Using another student's clicker for any reason
- Using another student's work while writing lab reports

Students must also adhere to UAF policies, the student code of conduct as well as the University of Alaska *Honor Code*, which states:

*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 with- out 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.*

### **Student success**

There are a large number of resources to help students who would like to perform at their best. The student may make an appointment to see the instructor for help. (The instructor will attempt to reply to email questions within 24 hours during the school week.) The Chemistry and Biochemistry Department has established the Chemistry Learning Center (CLC), which offers student led instruction. Students may also see a tutor for additional assistance. Laboratory teaching assistants are available for help during posted office hours.

### **Disabilities**

Students with a physical or learning disability are required to identify themselves to the Disability Services office, 474-7043, located in the Center for Health and Counseling. The student must provide documentation of the disability. Disability Services will then notify the instructor of special arrangements for taking tests, working homework assignments, and doing lab work.

**Computer Access:** Currently Department of Computing and Communications (DCC) maintains two open labs on campus: the Bunnell Lab, and the Node (Rasmussen library). The Node has 24-hour access.

**Support Services:** Support can be obtained through the University of Alaska Library system, online resources, and the instructor. Additional services are available through Student Support Services (<http://www.uaf.edu/sssp/>) at UAF.

**Classroom Etiquette:** The purpose of this information is to assist students in understanding proper classroom behavior. The classroom should be a learning centered environment in which faculty and students are unhindered by disruptive behavior. Students are expected to maintain proper decorum in the classroom and to stay for the entire length of class. If the student must plans to leave during class, they should inform the instructor prior to the start of class. The University of Alaska Fairbanks is an institution of higher education that promotes the free exchange of ideas. However, students must adhere to the rules set forth by the University and the instructor. Failure to comply with classroom rules may result in dismissal from the class and/or the University. Faculty have the authority to manage their classrooms to ensure an environment conducive to learning. The University of Alaska Student Code of Conduct (the Code), part of the Board of Regents Policy 09.02, is available at <https://www.alaska.edu/bor/policy/09-02.pdf>. You should be familiar with the Code as you will be held accountable to maintain the standards stated within. The Code includes the following statements:

P09.02.020.A As with all members of the university community, the university requires students to conduct themselves honestly and responsibly and to respect the rights of others. Students may not engage in behavior that disrupts the learning environment, violates the rights of others or otherwise violates the Student Code of Conduct (Code), university rules, regulations, or procedures. Students and student organizations will be responsible for ensuring that they and their guests comply with the Code while on property owned or controlled by the university or at activities authorized or sponsored by the university.

P09.02.030.B Behavior that occurs on property owned or controlled by the university, in university online environments and classes, or at activities sponsored by or authorized by the university, is subject to university student conduct review and disciplinary action by the university. The Student Code of Conduct may also apply to behavior that occurs off campus when it may present a potential danger or threat to the health and safety of others or may reasonably lead to a hostile environment on campus. The Student Code of Conduct may also apply to behavior exhibited online or electronically via email, social media, text messaging, or other electronic means.

**Amending this Syllabus:** The instructor may make changes to this syllabus. Any changes will be clearly communicated via email sent to your UAF e-mail account and posted on Blackboard.

## **Tips for Success in Chem 104X**

The course will move quickly and material is cumulative – i.e., new concepts build upon previous ones. Thus, it is important to keep up with the course on a daily basis. Some strategies for success:

- Come to class!
- Read before class. Readings are listed in the syllabus.
- Read actively, not passively – after each page, look away and recall main concepts.
- Take notes.
- Ask questions – don't understand something? Ask! Others likely have the same question.
- Start homework early.
- Practice every day – biochemistry is not merely about memorization of facts, but synthesizing and applying concepts. Cramming is not a great idea.
- Work out a variety of problems. Seeing differently worded problems helps solidify concepts.
- Study together – practice explaining concepts to others and how to work through problems.
- Contact me. Send me an email or make an appointment to see me.

## Tentative Class Schedule

Week	Date	Ch.	Topic	Assignment	Lab Experiment
1	Jan 17	10	Welcome and intro organic chemistry	HW1 open	No lab
	Jan 19	10	Intro organic chemistry		
2	Jan 22	11	Organic chemistry: Alkanes	HW2 open	Safety and Blood Buffers
	Jan 24	11	Organic chemistry: Alkanes		
	Jan 26	12.1-12.4 and 14.1	Organic chemistry: Alkenes, Alkynes, and Alcohols	<b>HW 1 due, Quiz #1</b>	
3	Jan 29	16.1-16.3 and 17.1-17.3	Organic chemistry: Amines, Aldehydes, and Ketones (functional groups)	HW 3 open, <b>HW 2 due</b>	Aspirin
	Jan 31	15.1-15.2	Organic chemistry: chirality		
	Feb 2	15.3-15.5	Organic chemistry: chirality	<b>Quiz #2</b>	
4	Feb 5	20.1-20.4	Carbohydrates	HW 4 open, <b>HW 3 due</b>	Soap
	Feb 7	20.5-20.6 and 21.1-21.6	Carbohydrates and Lipids		
	Feb 9	21.7-21.12	Lipids	<b>Quiz #3</b>	
5	Feb 12	22.1-22.7	Proteins: Amino acids	HW 5 open, <b>HW 4 due</b>	Casein
	Feb 14	22.8-22.13	Proteins: Structure and Function		
	Feb 16	23.1-23.5	Enzymes	<b>Quiz #4</b>	
6	Feb 19	23.6-2.8	Enzymes	HW 6 open, <b>HW 5 due</b>	Urease
	Feb 21	--	Review		
	Feb 23	--	<b>Exam 1</b>		
7	Feb 26	24.1-24.5	Chemical communication: Neurotransmitters and Hormones	HW 7 open, <b>HW 6 due</b>	DNA from onion
	Feb 28	24.6-24.8	Chemical communication: Neurotransmitters and Hormones		
	Mar 2	25.1-25.5	DNA/RNA	<b>Quiz #5</b>	
8	Mar 5	25.6-5.7	DNA/RNA	HW 8 open, <b>HW 7 due</b>	pGlo
	Mar 7	26.1-26.5	Gene Expression and Protein Synthesis		



	Mar 9	26.6-26.10	Gene Expression and Protein Synthesis	<b>Quiz #6</b>	
9	Mar 12		<b>Spring Break!</b>	HW 9 open, <b>HW 8 due</b>	
	Mar 14		<b>Spring Break!</b>		
	Mar 16		<b>Spring Break!</b>		
10	Mar 19	27.1-27.3	Bioenergetics: Metabolism	HW 10 open, <b>HW 9 due</b>	Vitamin C
	Mar 21	27.4	Bioenergetics: Citric Acid Cycle		
	Mar 23	27.5-27.7	Bioenergetics: Oxidative Phosphorylation	<b>Quiz #7</b>	
11	Mar 26		Review for Exam 2	HW 11 open, <b>HW 10 due</b>	Fermentation
	Mar 28		<b>Exam 2</b>		
	Mar 30	28.1-28.3	Catabolic Pathways: Glycolysis		
12	Apr 2	28.4-28.8	Catabolic Pathways: Glycolysis, Nitrogen and Urea Cycle	HW 12 open, <b>HW 11 due</b>	Carbohydrate
	Apr 4	28.9-28.10	Catabolic Pathways: Nitrogen and Urea Cycle	<b>Quiz #8</b>	
	Apr 6	Will provide	Muscle Contraction		
13	Apr 9	Will provide	Neurotransmission	HW 13 open, <b>HW 12 due</b>	SDS Page
	Apr 11	Will provide	Neurodegeneration		
	Apr 13	31.1-31.5	Immunochemistry	<b>Quiz #9</b>	
14	Apr 16	31.6-31.8	Immunochemistry	HW 14 open, <b>HW 13 due</b>	ELISA or Virology lab + blood typing
	Apr 18	30	Nutrition		
	Apr 20		Review	<b>Quiz #10</b>	
15	Apr 23		<b>Exam 3</b>	<b>HW 14 due</b>	Group presentation development
	Apr 25		Final Presentations		
	Apr 27		Final Presentations		
16	Apr 30		Final Presentations/Final Review		
	May 2		<b>Final Exam 3:15 – 5:15</b>		



**Syllabus Signature Page**  
University of Alaska Fairbanks

Instructor: Dr. Weltzin  
Course: Chem 104X  
Semester: Spring 2018

I \_\_\_\_\_, do agree that I received a copy of the course syllabus for Chem 104X. I have read and understand the course standards and expectations from the syllabus including that I am expected to attend class. I further understand that it is my responsibility to learn all of the course material covered in the text, lecture, homework, quizzes, assigned study questions, etc.

\_\_\_\_\_  
Print Full Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date