

Chemistry F104X (online): A Survey of Organic Chemistry and Biochemistry Spring 2023 Course Syllabus

Instructor: Dr. Maegan Weltzin
Office: Murie 113E
Email: mmweltzin@alaska.edu
Phone: (907) 474-6527
Office Hours: F 10:00 am – 12:00 pm or by appointment (va Zoom/Slack)

Course information: Chemistry F104X UX1 -- Intro Organic Chem & Biochem (3 credits) and lab (1 credit) (CRN 3442 & 33441) online course. The lab content can be found on the lecture Canvas page.

Course materials

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

- **Book:** Introduction to General, Organic, and Biochemistry 12th Ed. by Bettelheim, Brown, Campbell, Farrell and Torres (ISBN-13: 978-1337571357)
The 11th ed will work as well but the student is responsible for finding the corresponding sections.
- **Discussion Board:** Packback license (<https://questions.Packback.co/sign-up/create-account>)
- **Quick communication:** Slack account (free, click on the link in Canvas to connect to our course channel)
- **Laboratory:** Experiments in Survey of Org Chem & Biochem Chemistry 104X: Each laboratory link is available on Canvas.
- **Slower but necessary communication:** A University of Alaska email address is required for all communication in the class and to gain access to the laboratory materials. This also provides access to the Canvas 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 12th Ed

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 Description: Fundamentals of chemistry as applied to biological systems. 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.

Learning Outcomes	Specific Coverage
<ul style="list-style-type: none"> Learn how to write structural formulas to understand the structure of molecules. Be able to identify functional groups as sites for reactions to occur. Be able to name simple organic molecules so that you can accurately interpret the names of chemicals. Chemical isomers can be therapeutic but also life threatening. We will learn how to identify chemical isomers. 	I. Intro to organic chemistry
<ul style="list-style-type: none"> Learn how to describe and identify carbohydrates to better understand where we obtain some of our energy and material to build our bodies. 	II. Carbohydrates
<ul style="list-style-type: none"> Be able to describe and identify lipids to learn how our body stores and uses this source of energy and building material. 	III. Classification and functional roles of lipids
<ul style="list-style-type: none"> Proteins are critical to life. Be able to describe protein shape and how proteins function to better understand our metabolic pathways. 	IV. Structure and function of proteins
<ul style="list-style-type: none"> Learn how cells communicate by molecules to better understand how hormones and neurotransmitters work. 	V. Neurotransmitters and hormones
<ul style="list-style-type: none"> DNA is the building block of life. You will be able to describe nucleotide synthesis and the structure of DNA. Proteins are critical to life. We will learn how proteins are made and how they fold into their shapes to better understand metabolic pathways. 	VI. Nucleic acids, gene expression, and protein synthesis
<ul style="list-style-type: none"> Learn how the body converts food to energy via several metabolic pathways. 	VII. Nutrition and Digestion
	VIII. Bioenergetics: Metabolism, electron transport chain, citric acid cycle, and oxidative phosphorylation
	IX. Catabolic pathways: carbohydrate, lipid, and protein metabolism (glycolysis and urea cycle)

Course Goals: Structure and function is a recurrent theme in the course; molecular shape determines function. Students who successfully complete this course will have a basic 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 read the course material, watch the videos, review lecture notes, and perform the simulations each week. Weekly homework sets are assigned. These are not graded but will help you prepare for the weekly quizzes. Graded weekly quizzes will consist of about 5 questions and you will have 1hr to complete each quiz. It is highly recommended that you complete all of the previous week's material *before* attempting the quiz. There are 10 laboratory investigations due throughout the course. We also have a discussion board to help us connect our learned material to every day experiences. These responses are due weekly.

Students who earn high grades in this course typical practice active learning. 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. This introductory course covers a large amount of material and progresses fairly quickly. Please do your best not to fall behind.

Supplementing the course catalog, the course goals are to continue to build the student's skills solving biochemistry problems, reading critically, formulating questions, completing laboratory experiments and communicating information assimilated throughout the course by completing quizzes and exams. Class conduct should be professional as well as respectful of the rights other students to constructive learning experience.

Canvas: <https://canvas.alaska.edu>. Course information, supporting documents and grades for this course will be maintained on the UAF Canvas website. Time sensitive information and reminders will be sent occasionally to all students enrolled in the course using Canvas. Please verify your email address is correct and current.

Preparation: It is ***strongly*** recommended that each student reads the portion of the textbook that corresponds to each the material for each week *before* watching lecture videos, performing lab experiments, attempting the homework, starting quizzes, answering the Packback curiosity questions, or beginning exams. See course calendar for deadlines.

Homework

Homework problems will be assigned using questions from the textbook. Use these problem sets to better understand the material and to prepare for the quizzes. Homework is not graded. You will find the assigned problem sets in each Week module on Canvas.

Quizzes

We will have weekly quizzes (due Mondays) covering the material from the previous week. For example, we will have our first quiz week 2 that will cover week 1 material. The goal of the quizzes is to test your knowledge of the previous week's material and will cover similar material as the assigned homework. Quizzes are graded (while homework is not). You will have 1 hr to complete each quiz, which will contain on average five questions.

Packback Discussion Board Responses: We will use **Packback** as our class discussion board to connect course content to the everyday life. Students are expected to participate actively in the course via responses to discussion questions. Each week Dr. Weltzin will post a question

pertaining to an existing application of the course material. Students are expected to provide a thoughtful response to the instructor's question **and** respond at least once to a peer's response. To earn full points, you also need to ask **one** question in response to your peer's responses or the original posted question. Responses will be grade on the quality and detail of the response and sources cited. To earn full points, you must achieve a score of 40 (or great) curiosity points (CP). You can see your score when you post. Any time before the deadline, you can improve upon your post to increase your CP score. Additionally, student responses will be checked for plagiarism and originality. If your response has been plagiarized or is very similar to an already posted response, your response will be sent back to you and you will have the opportunity to revise your response so you can earn full points. Students should feel free and are encouraged to ask questions to each other about responses. Students will need to purchase a license (<https://questions.Packback.co/sign-up/create-account>).

Slack lab group meetings and office hours: Slack will be used for lab groups to communicate with each other and the instructor. The instructor will also host her office hours in Slack.

Final Project: At the end of the semester, students will prepare an infographic of a disease that is caused by an issue with one of the biochemistry topics we have covered in this course. These projects are intended to provide a personal connection to the core concepts learned in class. Students will upload their presentation infographics to Packback for peer and instructor evaluation. You will be responsible for grading and answering the assigned questions for **three** infographics made by your peers. These projects are intended to spur your creativity so have fun with it!

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 on Canvas each week. Lab reports must be turned in the following week (on Monday) to be graded. The laboratory portion of the student's grade will be based upon the average of the student's **10 lab reports**. **Failure to complete 7 laboratories will result in a failing grade** for the course. Please do the laboratory experiments. They are super fun and you will learn a lot! Late reports will not be accepted.

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. Four exams will be given as per the course schedule.

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

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

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 31, 2023. 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 Friday, March 31, 2023. The last day for instructor-initiated withdrawal is Friday, March 31, 2023 (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.

Evaluation Type	Points
Examination 1	100
Examination 2	100
Examination 3	100
Examination 4	100
Lab (10 labs, 26pts each)	260
Quizzes (10 quizzes, 10pts each)	100
Pack Back Discussion Board Responses (10 pts each; 12 total)	120
Final Project	100
Peer Evaluation and Question Responses of Final Presentations	20
Total	1000

Grade:	Percentage:
A+	97-100
A	90-96
A-	88-89
B+	86-87
B	80-85
B-	78-79
C+	76-77
C	70-75
C-	68-69
D+	66-67
D	60-65
D-	58-59
F	0-57

Work Ethic

It is expected that all work turned in by each student is work completed by the student. Feel free to work together on homework, labs, and discussion questions, but a student's submitted work must be conducted and written by that student. Any copying or plagiarism will earn a zero for that assignment and will be reported to the University. For exams, all work must be that of the student and not homework help sites, peers, tutors, etc. Anyone caught using these resources during an exam will earn a zero for the assignment and will be reported to the University.

Absences: Makeup examinations will be allowed for legitimate absences only, an unexplained absence from an exam will result 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 or assignment is due. If the absence is unexpected (illness, family or personal calamity), contact the professor at the earliest possible opportunity. For medical-related absences, a doctor's note is required. 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. For other course work, makeup work and extensions may be granted for legitimate absences only.

Packback Questions

Participation is a requirement for this course, and the Packback Questions platform will be used for online discussion about class topics. Packback Questions is an online community where you can be fearlessly curious and ask open-ended questions to build on top of what we are covering in class and relate topics to real-world applications.

Packback Requirements:

Your participation on Packback will count toward **12%** of your overall course grade.

There will be a Weekly Friday at 11:59PM AHST deadline for submissions. In order to receive your points per week, you should submit the following per each deadline period:

- 2 Responses per week (one to instructor's question, one to peer's question) with a minimum Curiosity Score of 40, each response is worth 3.25 pts
- 1 open-ended Question per week each worth 3.5 pts of each assignment grade, week with a minimum Curiosity Score of 40
- Half credit will be provided for responses that do not meet the minimum curiosity score.

How to Register on Packback:

An email invitation will be sent to you from help@Packback.co prompting you to finish registration. If you don't receive an email (be sure to check your spam), you may register by following the instructions below:

Create an account by navigating to <https://questions.Packback.co> and clicking "Sign up for an Account"

Note: If you already have an account on Packback you can log in with your credentials.

Then enter our class community's lookup key into the "Looking to join a community you don't see here?" section in Packback at the bottom of the homepage.

Community Lookup Key: e2934d11-8b71-438c-a35b-bfabdd1d69ef

Follow the instructions on your screen to finish your registration. Refer to www.Packback.co/product/pricing for more information.

How to Get Help from the Packback Team:

If you have any questions or concerns about Packback throughout the semester, please read their FAQ at help.Packback.co. If you need more help, contact their customer support team directly at help@Packback.co.

For a brief introduction to Packback Questions and why we are using it in class, watch this video: <https://www.youtube.com/watch?v=OV7QmikrD68>

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 doing homework or taking an exam
- Using another student's work while writing lab reports
- Using homework help sites, a tutor, or similar while taking an exam.
- Plagerism

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 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.

Plagiarism is defined as the use of "other" intellectual property without proper reference to the original author. Intellectual property includes all electronic, spoken or print media ***thus any information taken of the web is included under this statement.*** Students are expected to cite all sources used in oral and written presentations. Cases of plagiarism will be taken seriously with a grade 0 for the particular assignment. Severe cases may be referred to the Department Chair or Dean or class failing considered.

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.)

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 online classroom including during lab and when responding on the discussion board. Students are expected to be honest, professional, and courteous at all times. 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.

Student protections and services statement: Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: www.uaf.edu/handbook/.

COVID-19 Awareness: Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:
<https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0>

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

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 Canvas.

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:

- Read the material before watching the videos or viewing the lecture notes. Videos and readings are listed in the syllabus.
- Watch the course videos and read the lecture notes!
- Read actively, not passively – after each page, look away and recall main concepts.
- Take notes.
- Ask questions – don't understand something? Ask! Your instructor is here to help.
- Start homework early.
- Practice every day – biochemistry is not merely about memorization of facts, but synthesizing and applying concepts. Cramming is not a good 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 meet with me.