

Chemistry F104X (online): A Survey of Organic Chemistry and Biochemistry Spring 2020 Course Syllabus

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Course information: Chemistry F104X UX1 -- Intro Organic Chem & Biochem (3 credits) and lab (1 credit) (CRN 37201 & 37202) online course.

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.
- PackBack license (<https://questions.packback.co/sign-up/create-account>)
- Slack account (click on the link in Blackboard to connect to our course channel)
- Experiments in Survey of Org Chem & Biochem Chemistry 104X: A Laboratory Manual (free! Handouts can be printed from Blackboard, updated weekly)
- Laboratory Investigations Kit (order from <https://www.carolina.com/catalog/detail.jsp?prodId=581607> or purchase a voucher from the bookstore and follow the voucher instructions)
- 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

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 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 reads the portion of the textbook that corresponds to each unit before watching lecture videos, performing lab experiments, attempting OWL, or answering the PackBack curiosity questions (see course calendar).

Cell phones/Computers: 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.

Evaluation Type	Points
Examination 1	100
Examination 2	100
Examination 3	100
Examination 4	100
Lab	250
Homework (14 HW, 13pts each)	182
Pack Back Discussion Board Responses (8.1 pts each)	105
Final Project	63
Peer Evaluation and Question Responses of Final Presentations	15
Total	1015

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

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 a link (or 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. Each problem set is a "Mastery" question where you have to answer correctly two out of three similar types of questions to earn full points. You have a total of nine attempts to currently answer each Mastery question. Homework assignments for the week will be due according to the course schedule below no later than 11pm. 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.

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. 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 TA. 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!

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

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 9 lab reports**. Students may drop one lab miss one lab with no impact on their lab grade but lack of attendance or failure to complete 9 laboratories will result in a *failing* grade for the course. 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 final exam covering the last section of the course will be given as per the course schedule. The final exam must be taken by May 2 by 5pm (Alaska time zone). The final exam will cover Units 12-15.

Absences: Make up examinations at Testing Services 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. 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 doing homework or taking an exam
- 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 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.

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 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/.

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:

- Watch the course videos and read the PowerPoints!
- Read the material before watching the videos or viewing the PowerPoints. Videos and 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! Your instructor and TA are 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 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 meet with me.

Class Schedule

Unit (Chapter) [Monday date]	Topic and Activities	Assignment Due date
1 (Ch 10) [1/13]	<p>Welcome and intro organic chemistry: Alkanes</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Welcome letter ○ Ch. 10 ○ Review Ch 3 ○ Read "How to draw a Lewis dot structure" handout ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Welcome video ○ Video 1.1: Intro to Organic Chemistry ○ Video 1.2: How to Draw Structural Formulas ○ Video 1.3: Example: Drawing Structural Formulas ○ Video 1.4: Building functional groups • Simulations and Exercises: <ul style="list-style-type: none"> ○ On your own or with a buddy, draw and build functional groups covered in chapter 10, table 10-3 ○ Go to Functional Groups Matching Game (https://www.easynotecards.com/notecard-set/6736) ○ Review functional groups ○ Play Functional Groups Matching Games ○ <i>Optional:</i> Play Functional Groups Bingo • Lab Investigation: <ul style="list-style-type: none"> ○ No Lab Experiment- <i>Have you ordered your kit?</i> 	<ul style="list-style-type: none"> • PackBack Curiosity Question #1: Who are you? (Introduce yourself to the class using PackBack (Friday, 1/24)) • OWL HW #1 (1/20)- do all 3 parts • Find a time for us to meet using this doodle pole link: https://doodle.com/poll/ztkevffm37f4xhux
2 (Ch 11 & 12.1-12.4) [1/20]	<p>Intro organic chemistry: Identifying and Naming Alkanes, Alkenes, and Alkynes</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 11 ○ Ch 12.1-12.4 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 2.1: Alkane Introduction ○ Video 2.2: Naming unbranched alkanes ○ Video 2.3: Naming branched alkanes ○ Video 2.4: Cycloalkane configurations • Lab Investigation: <ul style="list-style-type: none"> ○ No Lab Experiment- <i>Has your kit arrived?</i> 	<ul style="list-style-type: none"> • PackBack Curiosity Question #2: PFAS and Your Health (Friday, 1/24) • OWL HW #2 (Monday, 1/27) • First Student-Instructor Conference

<p>3 (Ch 15) [1/27]</p>	<p>Chirality: The Handedness of Molecules</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 15 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 3.1: Learn to identify stereoisomers ○ Video 3.2 Racemic mixtures ○ Video 3.3: How to name enantiomers ○ Video 3.4: Determining number of stereoisomers and identifying diastereomers • Lab Investigation: <ul style="list-style-type: none"> • Safety lab, measurement and uncertainty, and graphing 	<ul style="list-style-type: none"> • PackBack Curiosity Question #3: Ibuprofen (Friday, 1/31) • OWL HW #3 (Monday, 2/3) • Lab Report- Safety lab (Tuesday, 2/4) • Exam 1 due next week (covering units 1-3)
<p>4 (Ch 30) [2/3]</p>	<p>Nutrition and Digestion</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 30 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 4.1: How does your digestive system work? ○ Video 4.2: How your digestive system works (more in-depth) ○ Video 4.3: Rwanda, Burundi- A story about nutrition • Exercise: <ul style="list-style-type: none"> ○ Go to USDA choosemyplate.gov, explore each food group ○ Take the quiz associated with each food group to test your knowledge • Lab Investigation: <ul style="list-style-type: none"> ○ Qualitative Synthesis of Aspirin 	<ul style="list-style-type: none"> • PackBack Curiosity Question #4 (Friday, 2/7) • Lab due Tuesday • OWL HW #4 (Monday, 2/10) • Lab Report- Aspirin (Tuesday, 2/11) • Exam 1: Units 1-3 <u>THIS</u> week (due by 5pm AK time Friday, 2/7)
<p>5 (Ch 20) [2/10]</p>	<p>Carbohydrates</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 20 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 5.1: How to draw Fischer projections ○ Video 5.2: The biochemistry of sugars and carbohydrates ○ Video 5.4: The deal with carbohydrates • Lab Investigation: <ul style="list-style-type: none"> ○ Chemistry of Life: pH and Buffers 	<ul style="list-style-type: none"> ○ Discussion Board Question #5 (Friday, 2/14) ○ OWL HW #5 (Monday, 2/17) ○ Lab Report-Chemistry of Life (Tuesday, 2/18)

6 (Ch 21) [2/17]	Lipids <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 21 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 5.1: The role of lipids in organisms ○ Video 5.2: What are simple lipids? ○ Video 5.3: What are complex lipids? ○ Video 5.4: What are steroids? • Lab Investigation: <ul style="list-style-type: none"> ○ Blood Typing and Simulated Blood 	<ul style="list-style-type: none"> • PackBack Curiosity Question #6 (Friday, 2/21) • OWL HW #6 (Monday, 2/24) • Lab Report-Blood typing (Tuesday, 2/25)
7 (Ch 22) [2/24]	Proteins <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 22 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ Video 7.1: What are proteins and amino acids? ○ Video 7.2: The peptide bond, the bond that holds amino acids together • Lab Investigation: <ul style="list-style-type: none"> ○ Fermentation of Sugar 	<ul style="list-style-type: none"> • PackBack Curiosity Question #7 (Friday, 2/28) • OWL HW #7 (Monday, 3/2) • Lab Report-Fermentation of sugar (Tuesday, 3/3)
8 (Ch 23) [3/2]	Enzymes <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 23 ○ Lecture Notes • Watch: <ul style="list-style-type: none"> ○ 8.1: Basic summary of enzymes ○ 8.2: How enzymes speed up chemical reactions ○ 8.3: Enzyme function and inhibition ○ 8.4: Enzymes in biochemical pathways • Simulations and Exercises: <ul style="list-style-type: none"> ○ Play the Enzyme game • Lab Investigation: <ul style="list-style-type: none"> ○ Isolation of Casein <p>REMINDER: Exam 2 (units 4-8) due WEEK AFTER SPRING BREAK (due 3/20 by 5pm AK time)</p>	<ul style="list-style-type: none"> • PackBack Curiosity Question #8 (Friday, 3/6) • OWL HW #8 (Monday, 3/16) • Lab Report- Isolation of casein (Tuesday, 3/17) • Second Student-Instructor Conference
3/9-3/13	Spring Break!	

<p>9 (Ch 24) [3/16]</p>	<p>Chemical Communication: Neurotransmitters and Hormones</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 24 ○ Lecture Notes • Simulations and Exercises: <ul style="list-style-type: none"> ○ Explore the insides of a cell • Watch: <ul style="list-style-type: none"> ○ Video 9.1: Communication of neurons ○ Video 9.2: Chemical messengers ○ Video 9.3: Amino acid and adrenergic messengers ○ Video 9.4: cAMP second messenger ○ Video 9.5: Peptidergic and steroid messengers • Lab Investigation: <ul style="list-style-type: none"> ○ Enzyme Catalysis 	<ul style="list-style-type: none"> • PackBack Curiosity Question #9 (Friday, 3/20) • OWL HW #9 (Monday, 3/23) • Lab Report- Enzyme Catalysis (Tuesday, 3/24) • Exam 2 (covering units 4-8) due <u>THIS</u> week (due 3/20 by 5pm AK time)
<p>10 (Ch 25) [3/23]</p>	<p>Nucleotides, Nucleic Acids, and Heredity</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 25 ○ Lecture Notes • Simulations and Exercises: <ul style="list-style-type: none"> ○ Work though “the DNA molecule is a twisted ladder” site ○ Play “Base Invaders” • Watch: <ul style="list-style-type: none"> ○ Video 10.1: How is DNA replicated? ○ Video 10.2: What are genes? • Lab Investigation: <ul style="list-style-type: none"> ○ DNA Extraction (cheek cell) 	<ul style="list-style-type: none"> • PackBack Curiosity Question #10 (Friday, 3/27) • OWL HW #10 (Monday, 3/30) • Lab Report-Biological Macromolecules and Enzymes (Tuesday, 3/31)
<p>11 (Ch 26) [3/30]</p>	<p>Gene Expression and Protein Synthesis</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 26 ○ Lecture notes • Watch: <ul style="list-style-type: none"> ○ Video 11.1: How is DNA transcribed into RNA? ○ Video 11.2: How is mRNA translated into proteins? ○ Video 11.3: How is gene expression regulated? • Lab Investigation: <ul style="list-style-type: none"> ○ DNA Replication, RNA Transcription, and Protein Synthesis 	<ul style="list-style-type: none"> • PackBack Curiosity Question #11 (Friday, 4/3) • OWL HW #11 (Monday, 4/6) • Lab Report- DNA extraction (Tuesday, 4/7) • Start working on Disease Infographic final project

	REMINDER: Exam 3 (units 9-11) due NEXT week (due 4/10 by 5pm AK time)	
12 (Ch 27) [4/6]	<p>Bioenergetics: How the body converts food to energy</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 27 ○ Lecture PowerPoints and example problems • Watch: <ul style="list-style-type: none"> ○ Video 11.1: What is metabolism? ○ Video 11.2: What is cell respiration? (big picture ideas) ○ Video 11.3a: How does the citric acid cycle work? ○ Video 11.3b (optional): Citric acid cycle song ○ Video 11.4: How does the electron transport chain work? • Simulations and Exercises: <i>After reading the book and watching the videos:</i> <ul style="list-style-type: none"> ○ Play the citric acid cycle game (simple) ○ Play citric acid cycle with enzymes game ○ Play the electron transport chain game • Lab Investigation: <ul style="list-style-type: none"> ○ Biological Macromolecules and Enzymes 	<ul style="list-style-type: none"> • PackBack Curiosity Question #12 (Friday, 4/10) • OWL HW #12 (Monday, 4/13) • Lab Report- DNA replication, RNA transcription, and protein synthesis (Tuesday, 4/14) • Continue working on Disease Infographic final project (draft due to me 4/15) <p>REMINDER: Exam 3 (units 9-11) due <u>THIS</u> week (due 4/10 by 5pm AK time)</p>
13 (Ch 28.1-28.3, 28.7) [4/13]	<p>Specific Catabolic Pathways: Carbohydrate, Lipid, and Protein Metabolism</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 28.1-28.3, 28.7 ○ Lecture notes • Watch: <ul style="list-style-type: none"> ○ Video 13.1: What is glycolysis? ○ Video 13.2: What are the reactions of glycolysis? ○ Video 13.3: Glycolysis summary ○ Video 13.4: How does pyruvate enter the citric acid cycle? • Simulations and Exercises: <ul style="list-style-type: none"> ○ Glycolysis game • Final Project: <ul style="list-style-type: none"> ○ Disease Infographic (send draft to me 4/15) 	<ul style="list-style-type: none"> • PackBack Curiosity Question #13 (Friday, 4/17) • OWL HW #13 (Monday, 4/20) • Disease Infographic (send draft to me 4/15) • Third Student-Instructor Telephone Conference
14 (Ch 28.4-28.10) [4/20]	<p>Specific Catabolic Pathways: Carbohydrate, Lipid, and Protein Metabolism</p> <ul style="list-style-type: none"> • Reading: <ul style="list-style-type: none"> ○ Ch. 28 ○ Lecture Notes 	<ul style="list-style-type: none"> • OWL HW #14 (Monday, 4/27) • Post infographic by 4/22 on PackBack

	<ul style="list-style-type: none"> • Watch: <ul style="list-style-type: none"> ○ Video 14.1: Fat metabolism- glycerol catabolism ○ Video 14.2: Fat metabolism- Carnitine shuttle and beta-oxidation of fatty acids ○ Video 14.3: Urea cycle • Simulations and Exercise: <ul style="list-style-type: none"> ○ Play the urea cycle game • Final Project: <ul style="list-style-type: none"> ○ Post infographic by 4/22 ○ Review and evaluate <u>3</u> peer infographics ○ Answer questions 	<ul style="list-style-type: none"> • Grade and answer questions for <u>3</u> student projects by 4/27 • Study for Final Exam
15 [4/27]	<p>Exam 4 (units 12-15) due May 2 by 5pm (AK time)</p> <p>Have a great summer!</p>	<p>Exam 4 is due this week</p>