Syllabus for CHEM 3: Introduction to Organic and Biochemistry

Course Information

Semester & Year:	Spring 2022
Course ID & Section #:	CHEM-3-E2816
Instructor's name:	Dr. David Duberow
Day/Time:	MW 10:05 – 11:30 am *(lecture, face-to-face or online)* F 10:00 am – 1:10 pm *(mandatory face-to-face lab)*
Location:	SC114 (Eureka Campus)
Number of proctored exams:	4
Number of units:	4.0

Instructor Contact Information

Office location:	SC216F
Office hours:	M – Th 9:00 – 10:00 am
Phone number:	707-476-4327
Email address:	David-Duberow@redwoods.edu

Required Materials

Textbook title:	*Fundamentals of General, Organic, and Biological Chemistry* ***(recommended)***
Edition:	3rd or later (4th preferred)
Author:	McMurry and Castellion
ISBN-13:	978-0131486843
ISBN-10:	0131486845
Other materials:	Safety goggles ***(required)***

Catalog Description

This course is a survey of organic and biochemistry for nursing majors and other allied health fields. Topics include general organic chemistry and biological chemistry as they apply to living systems. The laboratory component will support the course topics, including qualitative and quantitative experiments, and analysis of data.

Course Student Learning Outcomes

1. Draw and name structures containing common mono-functional organic molecules and differentiate functional groups when they appear in an organic structure, relating the physical and chemical properties of compounds containing these groups with the structure of each functional classification.
2. Distinguish roles of four major classes of bio-molecules in living cells.
3. Compare and contrast the processes of DNA replication and transcription, RNA translation, and common types of mutations.
4. Demonstrate knowledge of major biochemical components in metabolism.

Prerequisites

CHEM 2: Introduction to Chemistry

Course Overview

Chemistry 3 is a one-semester course designed to introduce students to a variety of fundamental concepts in organic and biochemistry, with a particular emphasis on applications in allied health professions. A passing grade in CHEM 2 (Introduction to Chemistry) or equivalent introductory chemistry course is a prerequisite.

Canvas Information

Course materials including lecture notes and videos, handouts, lab procedures, homework assignments and solutions, practice exams, announcements, and grades, will be posted on the course page on Canvas. Please monitor this site frequently to stay current on the material. Canvas can be accessed at https://redwoods.instructure.com. Your login ID is the same as your Webadvisor ID, and your initial password is your 8-digit birth date. For tech help, email its@redwoods.edu or call 707-476-4160. Canvas help for students is available online at https://webapps.redwoods.edu/tutorial. A Canvas orientation workshop can be accessed here: https://redwoods.instructure.com/courses/6781.

Homework

Homework problems are assigned at each lecture and are due at the beginning of lecture on the following Monday unless otherwise stated. Late homework will not be accepted. If you are unable to attend lecture, you must make arrangements to turn in your work by 10:05 am (email submission as a scanned PDF is acceptable). Daily problems are graded on a five-point scale unless otherwise noted and scaled to a total of 200 points at the end of the term.

Proctored Exams

There will be three midterm exams given during the normal laboratory period. Exams will be directly related to the lecture material, homework problems, and lab work from the weeks preceding the exam. A cumulative final exam will be given during the officially designated period or at a time mutually agreed upon by the class. Make-up exams are permissible only for serious illness or family emergency and must be documented. All exams are closed-book and must be completed individually without outside notes. Any instances of cheating will result in a zero for the assignment and disciplinary action by the college.

Evaluation & Grading Policy

Midterm 1	(Friday, Feb 11):	100 pts	10%
Midterm 2	(Friday, Mar 11):	100 pts	10%
Midterm 3	(Friday, Apr 22):	100 pts	10%
Final Exam	(to be determined):	200 pts	20%
Homework		200 pts	20%
Lab		300 pts	30%
TOTAL		**1000 pts**	**100%**

Letter grades will be assigned based on the following scale:

A	92-100%	B+	88-89%	C+	78-79%	D	60-69%
A-	90-91%	B	82-87%	C	70-77%	F	0-59%
		B-	80-81%				

Class Schedule

The following is a rough timeline for the material I intend to cover; however it is subject to change based on the needs of the class. The first portion of the course is designed to familiarize you with the basic structures and functional groups in organic chemistry. We will introduce selected classes of organic reactions as they apply to these functional groups with a particular focus on the interconversion between related functional groups. The final weeks will give you a preview of biochemistry, with an emphasis on biomolecular structure and metabolism.

Date	Lecture	Text Reference (4th ed)
17-Jan	***No Class: Martin Luther King Jr. Day***	
19-Jan	Atomic structure, valence electrons, bonding	1.3, 1.5 - 1.6, 3.1 - 3.8, 4.1 - 4.11, 5.1 - 5.6
21-Jan	*Lab Lecture: Covalent bonding, intermolecular forces*	5.8 - 5.9, 8.11, 8.1 - 8.2, 8.12 - 8.15, 9.2, 9.4
24-Jan	Chemical equations, equilibrium	6.1 - 6.2, 7.6
26-Jan	Linear and branched alkanes	12.1, 12.2 - 12.10
28-Jan	*Experiment 1: General Chemistry Review*	
31-Jan	Cycloalkanes, alkenes, alkynes, aromatic compounds	13.1 - 13.2, 13.4, 13.9 - 13.10
2-Feb	Functional groups	12.2, 13.2, 14.3, 16.2, 17.1
4-Feb	*Experiment 2: Organic Structures and Nomenclature*	
7-Feb	Stereoisomers	13.3, 18.5
9-Feb	Hydration, dehydration, alcohols, phenols, and thiols	13.5 - 13.7, 14.1 - 14.7, 14.9
11-Feb	***Midterm 1***	
14-Feb	Oxidation, reduction, aldehydes and ketones	14.5, 14.9, 16.1 - 16.6
16-Feb	Carboxylic acids, redox coenzymes, pathways	17.1 - 17.3, 21.7
18-Feb	***No Lab: Lincoln's Birthday***	
21-Feb	***No Class: President's Day***	
23-Feb	Reactions of organic acids, organic bases, amines	15.1 - 15.3
25-Feb	*Experiment 3: Identification of Functional Groups*	
28-Feb	Reactions of amines, structure and pH	15.4 - 15.6
2-Mar	Condensations, esters, ethers, amides, phosphates	17.4 - 17.5, 14.8, 17.8
4-Mar	*Experiment 4: Synthesis of Esters*	
7-Mar	Hydrolysis	17.6
9-Mar	*Midterm 2 review*	
11-Mar	***Midterm 2***	
14-Mar	***No Class: Spring Break***	
16-Mar	***No Class: Spring Break***	
18-Mar	***No Lab: Spring Break***	
21-Mar	Amino acids, proteins	18.1 - 18.4, 18.7
23-Mar	Protein structure	18.6, 18.8 - 18.12
25-Mar	*Experiment 5: Separation of Casein from Milk*	
28-Mar	Enzyme Catalysis	19.1 - 19.9
30-Mar	Vitamins, hormones, neurotransmitters, drugs	19.10, 20.1 - 20.11
1-Apr	*Experiment 6: Activity of Salivary Amylase*	
4-Apr	Monosaccharides, optical isomers, glycosidic bonds	22.1 - 22.7
6-Apr	Polysaccharides	22.8 - 22.9
8-Apr	*Experiment 7: Carbohydrates*	
11-Apr	Carbohydrate metabolism	23.1 - 23.6
13-Apr	Carbohydrate metabolism	23.6 - 23.11
15-Apr	*Experiment 8: Digestion of Proteins and Lipids*	
18-Apr	Lipids	24.1 - 24.4
20-Apr	*Midterm 3 review*	
22-Apr	***Midterm 3***	
25-Apr	Membrane lipids, steroids	24.5 - 24.9
27-Apr	Lipid metabolism	25.1 - 25.8
29-Apr	*Experiment 9: Saponification*	
2-May	Nucleic acids	26.1 - 26.7
4-May	Genomics	27.1 - 27.5
6-May	***Final Exam Review***	

Tips

One of the goals of this course is for you to become proficient in active learning. Think about the concepts as I introduce them in lecture and ask questions early if you don't understand something. Often, we will be working in groups to solve problems, so please come to lecture prepared to participate. When you read the text, think through the examples and work the practice problems. These exercises force you to apply what you are reading and are the best way to track your understanding. Budget two hours of coursework outside of class for each hour spent in class and spread this time evenly over the entire week. Try to find a regular group of classmates with whom you can meet regularly and work together on problems and discussions. Finally, if you find yourself struggling at any point, please come to see me during office hours, stop me after class, or email me. Concepts in chemistry tend to build on each other, and so not correcting an early misunderstanding will only hurt you in the long run.

Laboratory

Chemistry is fundamentally an experimental science, and as such it is best learned when it is experienced hands-on. Laboratory work will be an essential part of this course and will include both group work and chemical experimentation. A handout for each experiment will be posted to Canvas prior to lab and will include all procedures, pre-lab exercises, and report sheets necessary for the experiment.

Because our time in lab is limited, it is essential that you arrive prepared, having read the experiment thoroughly. You will be far more capable of making good observations and processing information efficiently if you are familiar with the procedure. More importantly, you will be far less likely to endanger yourself and/or your labmates if you are aware of what you are doing. *Be sure to check the laboratory schedule regularly to ensure you are prepared for the correct experiment*.

Proper lab attire must be worn at all times. Safety glasses are required for each experiment, even if particularly hazardous chemicals are not being used. *All students must wear safety glasses in the lab room whenever any group is conducting an experiment*. Long pants and closed-toed shoes are encouraged. It is strongly recommend that contact lenses not be worn in the lab, as they can trap chemicals and interfere with the eyewash in the event of an emergency. Students dressed inappropriately for lab may be asked to leave.

Regular lab attendance is mandatory throughout the semester, except in cases of *dire, documented emergency*. **If you miss lab during the first two weeks of the semester, you will be dropped from CHEM 3.** Although you are welcome to work on calculations and follow-up questions at home, your data and observations must be complete before leaving lab.

Most importantly, all students are expected to conduct themselves in compliance with posted safety regulations at all times. You will have the opportunity to work with dangerous chemicals over the course of the semester. Treat these chemicals with respect.

The laboratory component of CHEM 3 is worth 30% of your overall grade, with each lab report equivalent to 30 of the total 1000 points in the course. Points are awarded based on the accuracy of your results, answers to follow-up questions, and overall quality of your records. Report sheets are due one week after the completion of a given experiment unless otherwise stated in class.

The remaining 30 lab points are "discretionary points," awarded at the end of the semester to discourage flagrant instances of poor lab etiquette. Specific behaviors warranting discretionary point deductions include, but are not limited to, arriving to lab late or inappropriately dressed, rushing through experiments, spilling reagents, being uncooperative with your labmates, and leaving before your group has finished an experiment.

Admissions Deadlines and Enrollment Policies

Spring 2022 Dates:

Classes begin:	January 15
Martin Luther King Jr. Birthday (all campuses closed):	January 17
Last day to add a course:	January 21
Last day to drop course without a "W" and with refund:	January 28
Census Day (or 20% into class duration):	January 31
Last day to file P/NP *(only for classes where this is an option)*:	February 11
Lincoln's Birthday (all campuses closed):	February 18
Presidents Day (all campuses closed):	February 21
Last day to petition to graduate or apply for certificate:	March 3
Spring break (no classes):	March 14-19
Last day for student-initiated withdrawal (no refund):	April 1
Last day for faculty-initiated withdrawal (no refund):	April 1
Final exams:	May 7-13
Semester ends:	May 13
Grades available for transcript release:	May 30 (approx.)

Students who have experienced extenuating circumstances can complete & submit the ***Excused Withdrawal Petition*** to request an Excused Withdrawal (EW) grade instead of the current Withdrawal (W) or non-passing (D, F & NP) grades. The EW Petition is available from the Admissions and Records Forms Webpage. Supporting documentation is required.

Accessibility

College of the Redwoods is committed to making reasonable accommodations for qualified students with disabilities. If you have a disability or believe you might benefit from disability-related services and accommodations, please contact your instructor or Disability Services and Programs for Students (DSPS). Students may make requests for alternative media by contacting DSPS at 707-476-4280, or on the first floor of the Student Services Building.

If you are taking online classes, DSPS will email approved accommodations for distance education classes to your instructor. In the case of face-to-face instruction, please present your written accommodation request to your instructor at least one week before the needed accommodation so that necessary arrangements can be made. Last-minute arrangements or post-test adjustments cannot usually be accommodated.

Academic Dishonesty

In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the student's status in the course is left primarily to the discretion of the faculty member. In such cases where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

Disruptive Behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include, but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process, a disruptive student may be temporarily removed from class. In addition, the student may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the College Catalog and on the College of the Redwoods website.

Inclusive Language in the Classroom

College of the Redwoods aspires to create a learning environment in which all people feel comfortable in contributing their perspectives to classroom discussions. It therefore encourages instructors and students to use language that is inclusive and respectful.

Setting Your Preferred Name in Canvas

Students have the ability to have an alternate first name and pronouns to appear in Canvas. Contact Admissions & Records to request a change to your preferred first name and pronoun. Your preferred name will only be listed in Canvas. It does not change your legal name in our records. See the Student Information Update form.

Emergency Procedures/Everbridge

College of the Redwoods has implemented an emergency alert system called Everbridge. In the event of an emergency on campus you will receive an alert through your personal email and/or phones. Registration is not necessary in order to receive emergency alerts. Check to make sure your contact information is up-to-date by logging into WebAdvisor https://webadvisor.redwoods.edu and selecting 'Students' then 'Academic Profile' then 'Current Information Update.'

Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions. For more information see the Redwoods Public Safety Page.

In an emergency that requires an evacuation of the building anywhere in the District:

- Be aware of all marked exits from your area and building
- Once outside, move to the nearest evacuation point outside your building (please review the campus emergency map for evacuation sites)
- Keep streets and walkways clear for emergency vehicles and personnel
- Do not leave campus unless it has been deemed safe by the campus authorities.

Community College Student Health and Wellness

Resources, tools, and trainings regarding health, mental health, wellness, basic needs and more designed for California community college students, faculty and staff are available on the California Community Colleges Health & Wellness website.

Wellness Central is a free online health and wellness resource that is available 24/7 in your space at your pace.

Students seeking to request a counseling appointment for academic advising or general counseling can email counseling@redwoods.edu.

Student Support Services

The following online resources are available to support your success as a student:

- CR-Online (Comprehensive information for online students)
- Library Articles & Databases
- Canvas help and tutorials
- Online Student Handbook

Counseling and Advising offers academic support that includes academic advising and educational planning

Learning Resource Center includes the following resources for students:

- Academic Support Center for instructional support, tutoring, learning resources, and proctored exams.
- Library Services to promote information literacy and provide organized information resources.
- Multicultural & Diversity Center

Special programs are also available for eligible students include:

- Extended Opportunity Programs & Services (EOPS) provides services to eligible income disadvantaged students. These services include textbook award, career academic and personal counseling, school supplies, transportation assistance, tutoring, laptop, calculator and textbook loans, priority registration, cap and gown, workshops, and more.
- The TRiO Student Success Program provides eligible students with a variety of services including trips to 4-year universities, career assessments, and peer mentoring. Students can apply for the program in Eureka or in Del Norte
- The Veteran's Resource Center supports and facilitates academic success for active-duty military, veterans and dependents attending CR through relational advising, mentorship, transitional assistance, and coordination of military and veteran-specific resources.