

Molecules of Life: Biochemistry for Everyone

11:115:100

Two days per week (80 minutes each)

Please see our Canvas site for course information.



Contact Information

Instructor: Sharron Crane

email: sharron.crane@rutgers.edu

Office Hours by appointment

Course Overview

This course is a lecture and discussion-based course that is designed to introduce students with no science background to biochemistry as it relates to human health. Each semester, we will introduce biochemistry through the lens of its most current topics, such as metabolism and the microbiome, genetic engineering, and everyday pharmaceuticals. Students will have the opportunity to explore current topics in biochemistry that are of particular interest to them, and will participate in a number of in-class active learning experiences throughout the semester.

Core Curriculum Learning Goals addressed by this course:

CCO - Contemporary Challenges: Our Common Future

- Analyze the relationship that science and technology have to a contemporary social issue.

NS - Natural Science

- Understand and apply basic principles and concepts in the physical or biological sciences.

Course-specific Learning Goals

Upon completion of this course, students will be able to:

1. Identify, describe, and explain the cellular functions of the four major classes of biological macromolecules.
2. Articulate the importance of proper nutrition and evaluate the nutritional benefits of a number of products from a biochemical perspective (e.g., nutritional supplements, “superfoods,” protein shakes, etc.).
3. Explain, using examples, how heredity, behavior, and the environment can interact to cause metabolic variability in the population.
4. Describe and analyze current controversial topics in biochemistry as they relate to human health and / or the environment.
5. Explain, using examples, the importance of proper dosage guidelines for pharmaceuticals used to alleviate symptoms and combat pain.

Expected Grading Breakdown:

Quizzes	40%
Response Papers	15%
Online discussions	15%
Homework	10%
In-Class Assignments	5%
Capstone	15%

Assignment Details

Quizzes

One quiz / short exam will be administered per module. Quizzes will be primarily multiple choice and short answer questions.

Response Papers

Choose from the questions or prompts provided and write a short (5-7 paragraphs; 1000-1500 words) response. As part of your answer, please be sure to include a general description of the issue and the biological macromolecule(s) involved. Please provide properly formatted in-text citations and a reference list for any factual information provided.

Online discussions

Participate meaningfully in each of the online module discussions according to posted instructions (discussions will be held online in Canvas)

Homework

One homework will be assigned per module, typically during the second or third week of the module.

In-Class Assignments

Throughout the semester there will be a number of low-stakes in-class assignments. These will be primarily graded on a no credit/half credit/full credit scale or as “all or nothing.”

Capstone

At the beginning of the semester, I will ask you about what topics in biochemistry are most interesting to you. Then I will assign you to groups based on your interests. Your group will put together a presentation that you will record and post on our Canvas site. The presentation is not required to be a slideshow: if you would like to perform a skit, film a long-form advertisement or PSA, make a stop-

motion video, or present your media in some other way I certainly encourage creativity! The main criteria are that you address the basic biochemistry of the topic, how it relates to at least one of the three specific course modules, and how it relates to public health.

There will be some low-stakes assignments associated with this presentation: for example, your group may be asked to provide a plan / outline for your presentation ahead of time. You may also be asked to provide an honest assessment of your efforts and the efforts of your group members. In addition, there will be discussion boards for each of the presentations. Your group will manage your discussion board, and you will also watch and discuss three other groups' presentations.

Submission of Assignments

All assignments must be submitted through Canvas unless otherwise specified – I do not accept submissions via email.

In-class assignments cannot be submitted late. You must be present to earn credit for in-class assignments.

For online discussions of module topics, there is a “first post” due date and a “last post” due date. Both due dates will be clearly visible in the title of the discussion. The “last post” due date is the date that the assignment closes (the “until” date). Discussion posts cannot be submitted after this date.

Specific instructions will be provided for Capstone Presentation Uploads and Discussions.

Homework assignments and response papers will be accepted up to 48 hours late with no deduction in grade. If you cannot submit an assignment by the end of the 48-hour grace period, please attend office hours or make an appointment

with me so that I can determine whether I will accept your submission. Keep in mind that I do not accept submissions via email.

Expected Grading Scheme

≥90: A
85-89.9: B+
80-84.9: B
75-79.9: C+
70-74.9: C
60-69.9: D
<60: F

Communication Policy

If there is something you need to discuss with me, I prefer that you attend office hours, speak with me after class, or make an appointment. If you need to email me, please use your scarletmail account or the Canvas mail function. I generally respond to emails within two business days. Be sure to treat all emails as professional communications.

Academic Integrity

All members of the Rutgers community are expected to adhere to the University's [Academic Integrity Policy](#). The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as their own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.

- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which they are preparing.

Adherence to these principles is necessary to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated, and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

I am required to report any suspected violation of the policy to the [Office of Student Conduct](#). What happens after that depends on factors including the severity of the violation and whether or not is considered a first offense.

One of the most common offenses is plagiarism, either from an outside reference or from another student's work. Although you are encouraged to discuss things with each other, the work you submit must always be your own (or your group's,

in the case of group work). I often use the Turnitin function on Canvas to manage written assignments.

If you are unsure of how to properly use sources, please come to office hours or make an appointment with me so that we can go over it in more detail.

Students with Differing Abilities

Rutgers University welcomes students with disabilities into all the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation according to the [documentation guidelines](#). If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please visit the ODS website and follow the instructions for [getting registered](#).

Student Wellness Services

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/

www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to

succeed at Rutgers University. CAPS offers a variety of services that includes individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 /

www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

Diversity and Inclusion

One thing that makes Rutgers great is the diversity of our population. We are all here to learn from each other, and learning often takes the form of lively discussion and debate among people with different perspectives. If we are respectful to one another, discussion and debate can be valuable experiences. It is my priority to foster learning among students in the Rutgers community, and this requires that my classroom be a safe space for all. If anyone in the class says anything that makes you feel uncomfortable regarding your ethnic, religious, gender, or other identity, please let me know. Additionally, please let me know your preferred pronouns and preferred name. I want this class to be a positive experience for all of us!

Sample Schedule

<i>Meeting #</i>	<i>Topic</i>
	<i>The Basics</i>
1	Course Introduction; Properties of Life
2	Chemistry Basics – elements and the bonds they make
3	Chemistry Basics –Biological Macromolecules
4	Biological Macromolecules continued From Nonlife to Life; The Cell
5	From Nonlife to Life; The Cell The Central Dogma of Biology
6	The Central Dogma of Biology continued
7	Quiz 1: The Basics
	Biochemistry and Medicine
8	Why Do We Take Drugs? Introduction to Viruses
9	COVID-19 vs. The Flu Capstone Breakouts

10	Specific Immunity and Vaccines; Capstone Breakouts continued
11	COVID Medications Antibiotics as Cures for Bacterial Diseases
12	Antibiotics continued; Group Work Contract
13	The Opioid Epidemic
14	History of Pharmaceuticals
15	Quiz 2: Biochemistry of Pharmaceuticals
	Who's Afraid of the GMO?
16	Laws of Inheritance; Selection
17	Laws of Inheritance; Selection continued
18	Genetic Engineering Approaches
19	Genetic Engineering Approaches continued GMO Perspectives
20	GMO Perspectives

21	GMO Perspectives
	<i>Feeding Ourselves Right</i>
22	Energy and Metabolism
23	QUIZ 3
24	Nutrition
25	Nutrition continued; Metabolism "Food;" Metabolic Variability
26	"Food;" Metabolic Variability continued Diabetes
27	Lactose Intolerance
28	The Gut Microbiome

Quiz 4 will be administered during Finals Week at the scheduled time for this class.